ANNEXURE A

Kanya Maha Vidyalaya, Jalandhar City

(An Autonomous College)

Minutes of the 9th Meeting of Board of Studies

P.G. Department of Chemistry

Date: 13-06-2023

Time: 11:00 A.M.

Via Zoom video conferencing

Kanya Maha Vidyalaya, Jalandhar

(UGC Autonomous College)

P.G. Department of Chemistry

Proceedings of the Ninth Meeting of Board of Studies held on 13.06.2023

The ninth meeting of the Board of Studies was held in online mode via Zoom on 13-06-2023 at 11.00 AM

Date:13.06.2023 (Tuesday)

Time: 11.00 A.M.

Venue: Online Meeting via Zoom

The following members have attended the meeting and detailed minutes are listed below.

Members of BOS

1.	Dr. Manju Sahni, Associate Professor, Kanya Maha Vidyalaya, Jalandhar	Chairperson	Present
2.	Dr. Vandana Bhalla, Associate Professor, Dept. of Chemistry, Guru Nanak Dev University, Amritsar (**University Nominee)**	Member	Present
3.	Dr. Gaurav Bhargav, Assistant Professor, Dept. of Chemistry, IKGPTU, Kapurthala **(Outside Parent University Nominee)**	Member	Present
4.	Dr. J. Nagendra Babu, Assistant Professor, Central University of Punjab, Bathinda (**Outside Parent University Nominee)**	Member	Present
5.	Mr. Gurvinder Pal, General Manager, Bhogpur Cooperative Sugar Mills Ltd., Bhogpur **(Industry Expert)**	Member	Absent
6.	Dr.Harjeet Sra, Principal, Punjab College of Education, Sarkapra, Fatehgarh Sahib **(Alumni)**	Member	Present
7.	Mrs. Tank Sinderpal, Assistant Professor, Kanya Maha Vidyalaya, Jalandhar	Member	Present
8.	Dr. Narinderjit Kaur, Assistant Professor, Kanya Maha Vidyalaya, Jalandhar	Member	Present
9.	Dr. Shikha, Assistant Professor, Kanya Maha Vidyalaya, Jalandhar	Member	Present
10	Dr. Swati Awasthi, Assistant Professor, Kanya Maha Vidyalaya, Jalandhar	Member	Present

The meeting started with welcome address by Dr Manju Sahni, Head, P.G. Department of Chemistry. She apprised the members about the programmes in the department along with teaching and research strengths of the department. She took up the agenda items for deliberations one by one with the permission of committee members.

Chem: 2023: 9:1

To discuss and approve the minutes of Board of Studies held on 27.04.2022 and Action Taken Report.

Proceedings:

Minutes of previous BOS meeting held on 27.04.2022 were approved by all BOS members via email. The chairperson again gave summary of minutes for approval of the house. **(Annexure A).** The Action Taken Report (ATR) is attached herewith.

Action Taken Report (ATR)

Sr.No.	Agenda Item	Decision taken in Meeting	Action Taken
Chem: 2022: 8:1	To confirm the proceedings of seventh BOS meeting held on 17.04.2021	Proceedings of previous BOS meeting held on 17.04.2021 were approved by all BOS members.	Proceeding is confirmed.
Chem: 2022: 8:2	To discuss the Course Outcomes and proposed new syllabi of papers of **Master of Science (Chemistry)** Semester I to IV for the session 2022-23 under Credit Based Continuous Evaluation System.	All the BOS members approved the proposed Syllabi of papers of **Master of Science (Chemistry)** Semester I to IV for the session 2022-23 under Credit Based Continuous Evaluation System.	The approved syllabus is executed.
Chem: 2022: 8:3	To discuss the Course Outcomes and proposed new **Certificate course in Chemistry for Entrepreneurship and Production** for the session 2022-23.	All the BOS members approved the proposed Syllabi of new **Certificate course in Chemistry for Entrepreneurship and Production** for the session 2022-23.	The approved syllabus is executed.
Chem: 2022: 8:4	Syllabi of papers of	All the BOS members	The approved

	Master of Science (Chemistry) Semester III and IV for the session 2022-23 will remain the same as session 2021-22 under continuous evaluation system and has already been approved.	approved the proposed Syllabi of papers of M.Sc. (Chemistry) Semester III-IV for the session 2022-23 under continuous evaluation system.	syllabus is executed.
Chem: 2022: 8:5	To discuss the Course Outcomes and proposed new syllabus of chemistry of **Bachelor of Science (Biotechnology)** semester VI for the session 2022-23 under continuous evaluation system.	All the BOS members approved the proposed syllabi of chemistry of class **Bachelor of Science (Biotechnology)** semester VI for the session 2022-23 under continuous evaluation system.	The approved syllabus is executed.
Chem: 2022: 8:6	To discuss the Course Outcomes and proposed syllabus of chemistry of class **Bachelor of Science** semester I to VI, **Bachelor of Science (Biotechnology)** semester I and III, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Maths** Semester I, **Bachelor of Science (Hons) Physics** semester I to IV for the session 2022-23 will remain the same as session 2021-22 under continuous evaluation system and has already been approved	All the BOS members approved the proposed syllabi of chemistry of class **Bachelor of Science** semester I to VI, **Bachelor of Science (Biotechnology)** semester I and III, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Maths** Semester I, **Bachelor of Science (Hons) Physics** semester I to IVfor the session 2022-23.	The approved syllabus is executed.

Chem: 2022: 8:7	To discuss and approve list of proposed examiners for **Master of Science (Chemistry)** semester I to IV, **Bachelor of Science** semester I to VI, **Bachelor of Science (Biotechnology)** semester I, III and VI, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Maths** Semester I, **Bachelor of Science (Hons) Physics** semester I to IV for the session 2022-23	All the BOS members approved list of proposed examiners for **Master of Science (Chemistry)** semester I to IV, **Bachelor of Science** semester I to VI, **Bachelor of Science (Biotechnology)** semester I, III and VI, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Maths** Semester I, **Bachelor of Science (Hons) Physics** semester I to IV for the session 2022-23	List of Examiners was sent to COE Office.
Chem: 2022: 8:8	To discuss research inputs and plans of the department for the session 2022-23.	Dr. Manju Sahni apprised the committee members about the research and future plans taken by the Department for the research enhancement of faculty. She briefly explained that faculty members are engaged in quality research as evident from their publications in SCOPUS index Journals with high impact factors.	Dr. Shikha has published three research papers in SCOPUS index Journals. Dr. Narinderjit has submitted two MOOC's on SWAYAM portal. She has also translated four MOOC courses in Hindi. The undergraduate students of department are also doing projects under DBT Star College Scheme and Seed

			Money grant.
Chem: 2022: 8:9	To discuss innovative teaching methodologies and evaluation adopted in the department and inputs required to upgrade the same	Dr. Manju Sahni apprised the BOS members of teaching practices adopted in the Department especially in the current days of COVID-19, like LMS online teaching, through zoom app, uploading of video and audio recordings of different topics, through Google drive and YouTube etc. She highlighted the departmental activities like workshops, quiz and extension lectures organised from time to time. The teaching methodologies adopted in department were appreciated and approved by the house.	All the teachers are engaged in LMS online teaching, through zoom app, uploading of video and audio recordings of different topics, through Google drive and YouTube.

The house approved the Item Chem: 2023: 9:1

Chem: 2023: 9:2

To discuss the Course scheme, Course Outcomes and proposed syllabi of papers of **Master of Science (Chemistry)** Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) with 30% internal assessment for the session 2023-24.

Proceedings:

Chairperson Dr. Manju Sahni discussed in detail the Course scheme, Course Outcomes and proposed syllabi of papers of **Master of Science (Chemistry)** Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) with 30% internal assessment for the session 2023-24. The following points were highlighted, discussed and approved.

1) Master of Science (Chemistry) Semester I and II for session 2023-24 will have 52 credits.

2) Inter Disciplinary subjects offered will be optional and only grades will be assigned.

3) It was decided to add 20% internal assessment in all papers of **Master of Science (Chemistry)** Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24.

4) The credit of MCHM-113, Computer for Chemists was changed from 3 credits to 2 credits. So proportionately the syllabus was also decreased with the permission of the BOS members. Following topics were deleted.

Course Code: MCHL-1084

Course name: Spectroscopy A: Techniques for Structure Elucidation of Organic Compounds

Deleted: Unit I: Low and High resolution spectra with various examples, Correlation of H bound to carbon, H bound to other nuclei such as nitrogen, oxygen, sulphur, Complex spin-spin interaction, between two or more nuclei, Brief introduction to multipulse NMR spectroscopy.

Unit II: Exact masses of nuclides, Special methods of GCMS, high resolution MS, Introduction to radical anion mass spectroscopy.

Added: Nil

Course Code: MCHL-2085

Course name: Spectroscopy B: Techniques for Structure Elucidation of Inorganic Compounds

Deleted: Unit II: Use of symmetry considerations to determine the number of active I.R, and Raman lines (character tables to be provided in the Examination).

Unit III: **Applications** of Raman and IR selection rules to the determination of Inorganic structure with special emphasis on: (i) Metalcarbonyls (ii)NSF_3 (iii) Geometrical isomerisan – differentiation between Cis and trans. $[Co(bipy)_2Cl_2]Cl$. (iv) Structures of CO_2, N_2O, H_2O, chlorocomplexes of mercury, camium and zinc and some octahedral complexes ML_6 (eg. SiF_6^{2-}, PF_5^-,SF_6).Changes in the spectra of donor molecules upon coordination with special emphasis on N, N – dimethyl – acetamide and DMSO with Fe^{3+}, Cr^{3+}, Zu^{2+}, Pd^{2+} and Pt^{2+}ions, I.R spectroscopy and modes of coordination of SO_4^{2-}, N_2, O_2, NO, CO_3^{2-} , NO_3^-Unit IV: Application of {$^{57}F_e$, $^{119}S_N$, $^{151}E_U$ compounds, to biological systems to surface study, I_2CI_6, IBr_2 CL_4, XeF_4, $XeCI_4$. group 14 tetra halides, R_3MX_2 (M=As,Sb,Bi), Cis and Trans$[Co(en)_2Cl_2]Cl$, Polyhalide ion, BrCN, HIO_3 (1,2).

Added: Nil

Course Code: MCHM-1135

Course name: Computer for Chemists

Deleted: UNIT-I Principles of programming, truncation effects

UNIT-II Floating point numbers, scientific notation, converting integers to floating point and vice versa, coercion and cast operator, type char

Added: UNIT-I Introduction to programming, Data Types, assignment statement, arithmetic operators.

UNIT-II Input/Output Fuctions

5) In paper MCHL-2082, Organic Reaction Mechanism – II, the topics repeated in Unit II, III and IV were rearranged. The details are discussed below.

Course Code: MCHL-2082

Course Title: Organic Reaction Mechanism – II

Deleted: Unit II Addition to Carbon – Hetero Multiple Bonds –A: Mechanism of metal hydride reduction of saturated and unsaturated carbonyl compounds, acids, esters and nitriles, Wittig reaction. **(These reactions are also studied in UNIT IV).**

Unit III: (a) Addition to Carbon – Hetero Multiple Bonds –B was shifted from Unit III to Unit II and renamed as Addition to Carbon – Hetero Multiple Bonds.

Unit III:(b) Aldol condensation, Claisen reaction, Mannich reaction, Mannich bases as intermediates in organic synthesis were deleted as these reactions are already studied in Unit II.

6) The course scheme with credits is as follows:

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

Master of Science
(Chemistry)
Credit Based Continuous Evaluation Grading System
(CBCEGS)
(Session: 2023-2024)
Semester I

Master of Science (Chemistry) Semester I

Course Code	Course Title	Course Type	Hours Per Week L-T-P	Credits L-T-P	Total Credits	Marks				Examination time (in Hours)
						Total	Th	P	CA	
MCHL-1081	Ligand Field Theory	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-1082	Organic Reaction Mechanism-I	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-1083	Physical Chemistry – Thermodynamics	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-1084	Spectroscopy A: Techniques for Structure Elucidation of Organic Compounds	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHM-1135	Computer for Chemists	C	1-0-2	1-0-1	2	50	20	20	10	3+3
MCHP-1086	Inorganic Chemistry Practical (Quantitative Analysis)	C	0-0-6	0-0-3	3	75	-	60	15	3*2
MCHP-1087	Organic Chemistry Practical	C	0-0-6	0-0-3	3	75	-	60	15	3*2
Student can opt any one of the following Interdisciplinary optional courses		IDE			-					
Total					**24**	**600**				

IDEC-1101*	Communication Skills		4-0-0			100	80	-	20	3
IDEM-1362*	Basics of Music (Vocal)		2-1-1			100	40	40	20	
IDEH-1313*	Human Rights and Constitutional Duties		4-0-0			100	80	-	20	
IDEI-1124*	Basics of Computer Applications		2-0-4			100	50	30	20	3+3
IDEW-1275	Indian Heritage: Contribution to the world		4-0-0			100	80	-	20	3
(*Credits of these ID courses will not be added to SGPA)										

C- Compulsory Course

IDE- Inter Disciplinary Elective Course

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

Master of Science (Chemistry)
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2023-2024)

Semester II

Master of Science (Chemistry) Semester II										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	**Th**	**P**	**CA**	
MCHL-2081	Organometallics Chemistry	C	4-0-0	4-0-0	4	100	80	-	20	3

MCHL-2082	Organic Reaction Mechanism -II	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2083	Physical Chemistry – Quantum Chemistry	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2084	Reaction Mechanisms and Metal clusters	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2085	Spectroscopy B: Techniques for Structure Elucidation of Inorganic Compounds	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2336 MCHL-2056	Mathematics for Chemists Biology for Chemists	C	2-0-0	2-0-0	2	50	40	-	10	3
MCHP-2087	Organic Chemistry Practical	C	0-0-6	0-0-3	3	75	60	-	15	3*2
MCHP-2088	Physical Chemistry Practical	C	0-0-6	0-0-3	3	75	60	-	15	3*2
Total					**28**	**700**				

C- Compulsory Course

Note: Mathematics for Chemists: For Medical Students

Biology for Chemists: For Non-Medical Students

The detailed syllabus for **Master of Science (Chemistry)** Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24 as discussed and passed in BOS meeting is attached herewith as an **Annexure B.**

The house approved the Item: Chem: 2023: 9: 2

Chem: 2023: 9:3

To discuss the Course scheme, Course Outcomes and proposed syllabi of chemistry of class **Bachelor of Science** semester I to II, **Bachelor of Science (Biotechnology)** semester I, **and**

Bachelor of Science (Hons) Maths Semester I, under Credit Based Continuous Evaluation Grading System (CBCEGS) with 30% internal assessment for the session 2023-24.

Proceedings:

1) **In Bachelor of Science** semester I to II under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24, **Chemistry** subject will have 7 credits in each semester. It was decided to add 20% internal assessment in all papers of **Bachelor of Science** Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24.

2) In Bachelor of Science (Biotechnology) semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24, **Chemistry** subject will have 6 credits in semester I. It was decided to add 20% internal assessment in all papers of **Bachelor of Science (Biotechnology)** Semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24.

3) **Bachelor of Science (Hons) Maths** has been changed to Five Years Integrated Program (FYIP) and renamed as **Master of Science (Mathematics) (FYIP)** Semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24, **Chemistry** subject will have 4 credits in semester I. It was decided to add 20% internal assessment in all papers of **Master of Science (Mathematics) (FYIP)** Semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24.

4) The course scheme with credits is as follows:

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2023-2024)

Bachelor of Science (Semester I)													
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credit**	**Course Code**		**Course Type**	**Total marks**		**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
										L	**P**		
Chemistry	2-0-0	2-0-0		BSMM-1084	I	C	175	50	Chemistry (Inorganic Chemistry)	40	-	10	3
					II			75	Chemistry (Organic	60	-	15	3

	3-0-0	3-0-0	7						Chemistry)				
	0-0-4	0-0-2		BSNM-1084	P			50	Chemistry (Practical)	-	40	10	3.5

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2023-2024)

Bachelor of Science (Semester II)												
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credit**	**Course Code**	**Course Type**	**Total marks**		**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
									L	**P**		
Chemistry	3-0-0	3-0-0	7	BSMM-2084 I	C	175	75	Chemistry (Inorganic Chemistry)	60	-	15	3
	2-0-0	2-0-0		II			50	Chemistry (Physical Chemistry)	40	-	10	3
	0-0-4	0-0-2		BSNM-2084 P			50	Chemistry (Practical)	-	40	10	3.5

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Biotechnology)

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2023-2024)

Bachelor of Science (Biotechnology) Semester-I							
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**	**Examination time (in Hours)**

						Total	Th	P	CA	
BBTL-1087	Chemistry-I	C	4-0-0	4-0-0	4	100	80	-	20	3
BBTP-1082	Lab in Chemistry-I	C	0-0-4	0-0-2	2	50	-	40	10	3.5

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF FIVE YEARS INTEGRATED PROGRAM (FYIP)

Bachelor of Science (Honours) Mathematics

Credit Based Continuous Evaluation Grading System (CBCEGS) (Session: 2023-2024)

Master of Science (Mathematics)(FYIP) **(Semester I)**										
Course Code	**Course Title**	**Course Type**	**Hours Per Week** **L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	Th	P	CA	
FMAM-1085	Physical Chemistry	C	3-0-2	3-0-1	4	100	60	20	20	3 (Theory) 3.5(Practical)

The Course scheme, Course Outcomes and proposed syllabi of chemistry of class **Bachelor of Science** semester I to II, **Bachelor of Science (Biotechnology)** semester I, **and Master of Science (Mathematics) (FYIP)** Semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) with 20% internal assessment for the session 2023-24 as discussed and passed in BOS meeting is attached herewith as an **Annexure C.**

The house approved the Item: Chem: 2023: 9: 3

Chem: 2023: 9:4

Syllabi with 20% internal assessment and list of examiners of papers of **Master of Science (Chemistry)** Semester III and IV for the session 2023-24 will remain the same as session 2022-23 under Credit Based Continuous Evaluation Grading System and has already been approved.

Proceedings:

The IDE in **Master of Science (Chemistry)** Semester III which was previously compulsory will now be optional (scheme attached). All BOS members approved item **Chem: 2023: 9:4** for the session 2023-24 under Credit Based Continuous Evaluation Grading System.

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

Master of Science (Chemistry)

Credit Based Continuous Evaluation Grading System (CBCEGS)

(Session: 2022-2024)

Semester III										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	**Th**	**P**	**CA**	
MCHL-3081	Inorganic Chemistry-II	C	4-0-0	4-0-0	4	50	40	-	10	3
MCHL-3082	Organic Synthesis	C	4-0-0	4-0-0	4	50	40	-	10	3
MCHL-3083	Surface and Polymer Chemistry	C	4-0-0	4-0-0	4	50	40	-	10	3
MCHL-3084	Photochemistry and Pericyclic reactions	C	4-0-0	4-0-0	4	50	40	-	10	3
MCHP-3085	Inorganic Chemistry Practical (Preparations)	C	0-0-6	0-0-3	3	75	-	60	15	3*2
MCHP-3086	Physical Chemistry Practical	C	0-0-6	0-0-3	3	75	-	60	15	3*2
Student can opt any one of the following Interdisciplinary optional courses. The ID course opted in Sem-I cannot be opted in Sem-III.		IDE	-	-	-	-	-	-	-	-
Total					**22**	**350**				

IDEC-3101*	Communication Skills		4-0-0			100	80	-	20	3
IDEM-3362*	Basics of Music (Vocal)		2-1-1			100	40	40	20	
IDEH-3313*	Human Rights and Constitutional Duties		4-0-0			100	80	-	20	
IDEI-3124*	Basics of Computer Applications		2-0-4			100	50	30	20	3+3
IDEW-3275*	Indian Heritage: Contribution to the world		4-0-0			100	80	-	20	3

(*Credits of these ID courses will not be added to SGPA)

Master of Science (Chemistry) Semester IV

Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	**Th**	**P**	**CA**	
MCHL-4081	Advanced Inorganic Chemistry	C	4-0-0	4-0-0	4	75	60	-	15	3
MCHL-4082	Chemistry of Natural Products	C	4-0-0	4-0-0	4	75	60	-	15	3
MCHL-4083	Electrochemistry and Chemical Dynamics	C	4-0-0	4-0-0	4	75	60	-	15	3
MCHP-4084	Advanced Practical-Organic Synthesis	C	0-0-6	0-0-3	3	50	-	40	10	3*2
MCHP-4085	Advanced Practical-Inorganic Synthesis	C	0-0-6	0-0-3	3	50	-	40	10	3*2
MCHP-4086	Advanced Practical-Physical Chemistry	C	0-0-6	0-0-3	3	50	-	40	10	3*2
Total					**21**	**375**				

The house approved the Item: Chem: 2023: 9: 4

Chem: 2023: 9:5

The syllabi with 20% internal assessment and list of examiners of chemistry of class **Bachelor of Science** semester III to VI, **Bachelor of Science (Biotechnology)** semester III and VI, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Physics** semester III and IV for the session 2023-24 will remain the same as session 2022-23 under Continuous Evaluation System and has already been approved. The syllabi of **Certificate course in Chemistry for Entrepreneurship and Production** for the session 2023-24 will remain the same as session 2022-23 under Credit Based Continuous Evaluation Grading System and has already been approved.

Proceedings:

All the BOS members approved the syllabi of chemistry of **Bachelor of Science** semester III to VI, **Bachelor of Science (Biotechnology)** semester III and VI, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Physics** semester III and IV for the session 2023-24 under Continuous Evaluation System and the syllabi of **Certificate course in Chemistry for Entrepreneurship and Production** for the session 2023-24 under Credit Based Continuous Evaluation Grading System.

The house approved the Item: Chem: 2023: 9: 5

Chem: 2023: 9:6

To discuss and approve list of proposed examiners for **Master of Science (Chemistry)** semester I and II, **Bachelor of Science** semester I and II, **Bachelor of Science (Biotechnology)** semester I, **Bachelor of Science (Hons) Maths** Semester I, for the session 2023-24.

Proceedings:

All the BOS members approved the list of proposed examiners for **Master of Science (Chemistry)** semester I and II, **Bachelor of Science** semester I and II, **Bachelor of Science (Biotechnology)** semester I, **Master of Science (Mathematics) (FYIP)** Semester I, for the session 2023-24. **(Annexure D)**

The house approved the Item: Chem: 2023: 9: 6

Chem: 2023: 9:7

To discuss and approve the ordinance of **Bachelor of Science** and **Master of Science (Chemistry)** programmes.

Proceedings: The ordinance of **Bachelor of Science** and **Master of Science (Chemistry)** programmes was discussed and approved by the BOS members.

The house approved the Item: Chem: 2023: 9: 7

Chem: 2023: 9:8

To discuss research inputs and plans of the department for the session 2023-24.

Proceedings:

Dr. Manju Sahni apprised the committee members about the research and future plans taken by the department for the research enhancement of faculty. She explained that department has five Ph. D teachers and two M.Sc teachers. Faculty members are engaged in quality research as evident from their publications in SCOPUS index Journals with high impact factors. Dr. Narinderjit has registered three copyrights. She is also doing interdisciplinary project with Department of Fashion Designing under Seed Money grant of KMV. Tank Sinderpal Kabal Singh has published one research paper and one paper communicated in ESCI indexed Journals. Dr. Shikha, Dr. Swati and Tank Sinderpal Kabalsingh were allotted the seed money project by IQAC. The house highly appreciated the research work of the department.

Chem: 2023: 9:9

To discuss innovative teaching methodologies and evaluation adopted in the department and inputs required to upgrade the same.

Proceedings:

Dr. Manju Sahni apprised the BOS members of teaching practices adopted in the Department. BOS members appreciated the innovative teaching methodologies adopted by department like-ICT based teaching as Ppts, educational videos seminars leading to critical and creative thinking. She highlighted the departmental activities like quiz, workshops, educational trips and extension lectures from luminaries across globe is regular feature of department for overall development of students to create passion for science Other highlights of department include student-student mentoring, group discussions, student mentoring by teachers and remedial classes for weak students.

The meeting ended with Vote of thanks by Dr. Manju Sahni and assured that we will definitely work on the proposals suggested by the members. At the end, she said that all the achievements are due to excellent teamwork and she has full faith in her team for prospective growth of department under Autonomous status.

The house approved the (Item: Chem: 2023: 9:9) teaching methodologies and various activities held in department to enhance teaching learning process.

Chem: 2023: 9:10

To discuss the result analysis for the session 2022-23.

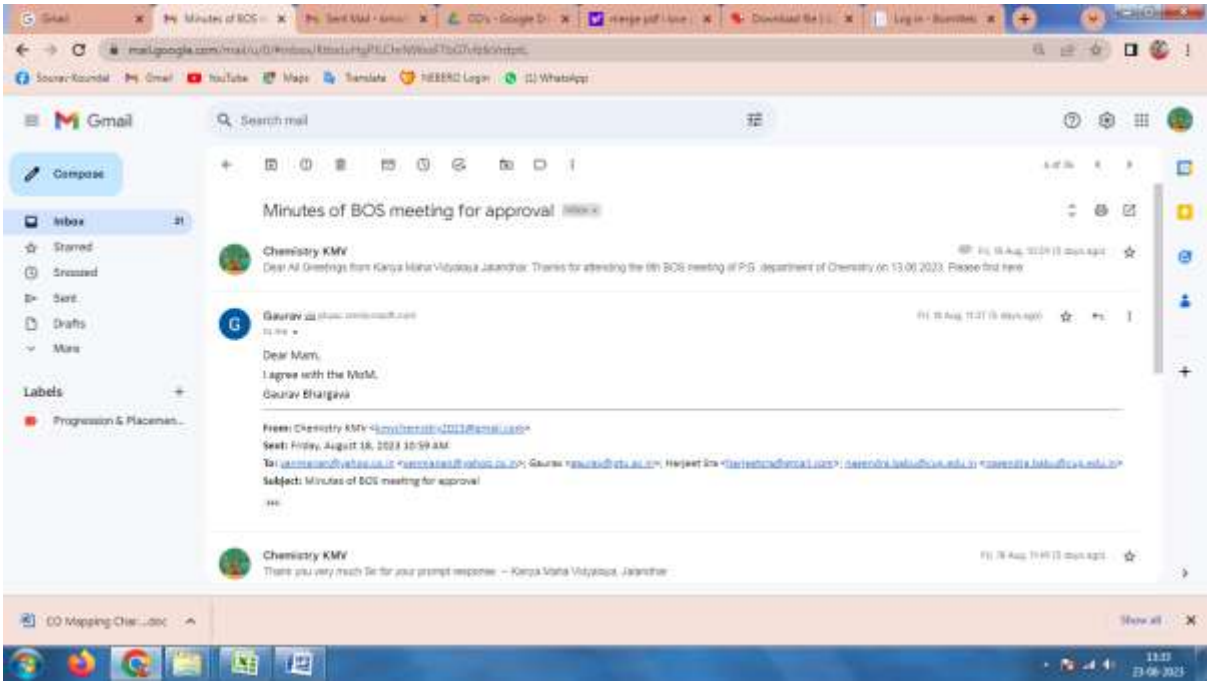
Proceedings: BOS members appreciated the result of all classes. **(Annexure E)**

<u>The house approved the Item: Chem: 2023: 9: 10</u>

Dr. Vandana Bhalla **(VC Nominee)**	**Dr. J. Nagendra Babu** **(Outside GNDU Nominee)**	**Dr. Gaurav Bhargav** **(Outside GNDU Nominee)**
Mr. Gurvinder Pal **(Industry Expert)**	**Dr.Harjeet Sra** **(Alumni)**	**Mrs. Tank Sinderpal**
Dr. Narinderjit Kaur	**Dr. Shikha**	**Dr Swati Awasthi**

Dr. Manju Sahni

(Head of the Department)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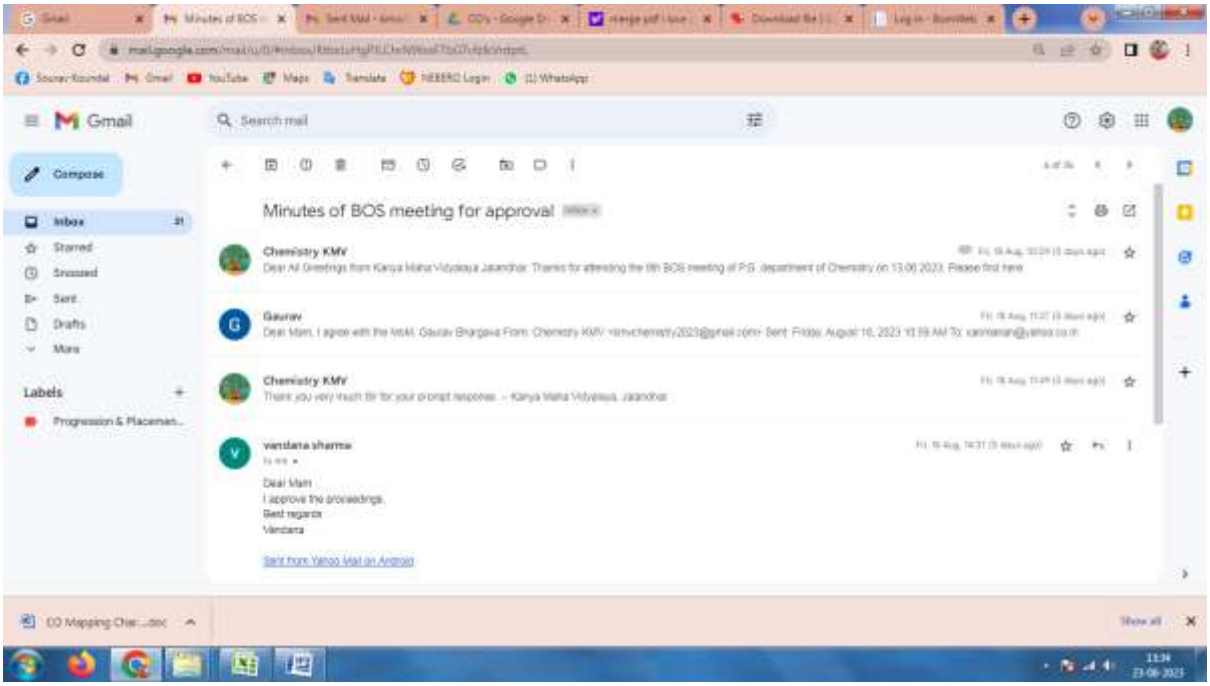
Minutes of BOS meeting for approval
Chemistry KMV
Dear All Greetings from Kanya Maha Vidyalaya Jalandhar. Thanks for attending the 6th BOS meeting of P.G. department of Chemistry on 13.08.2023. Please find here
Gaurav
Dear Mam,
I agree with the MoM.
Gaurav Bhargava
From: Chemistry KMV
Sent: Friday, August 18, 2023 10:59 AM
Subject: Minutes of BOS meeting for approval
Chemistry KMV
Thank you very much Sir for your prompt response. – Kanya Maha Vidyalaya, Jalandhar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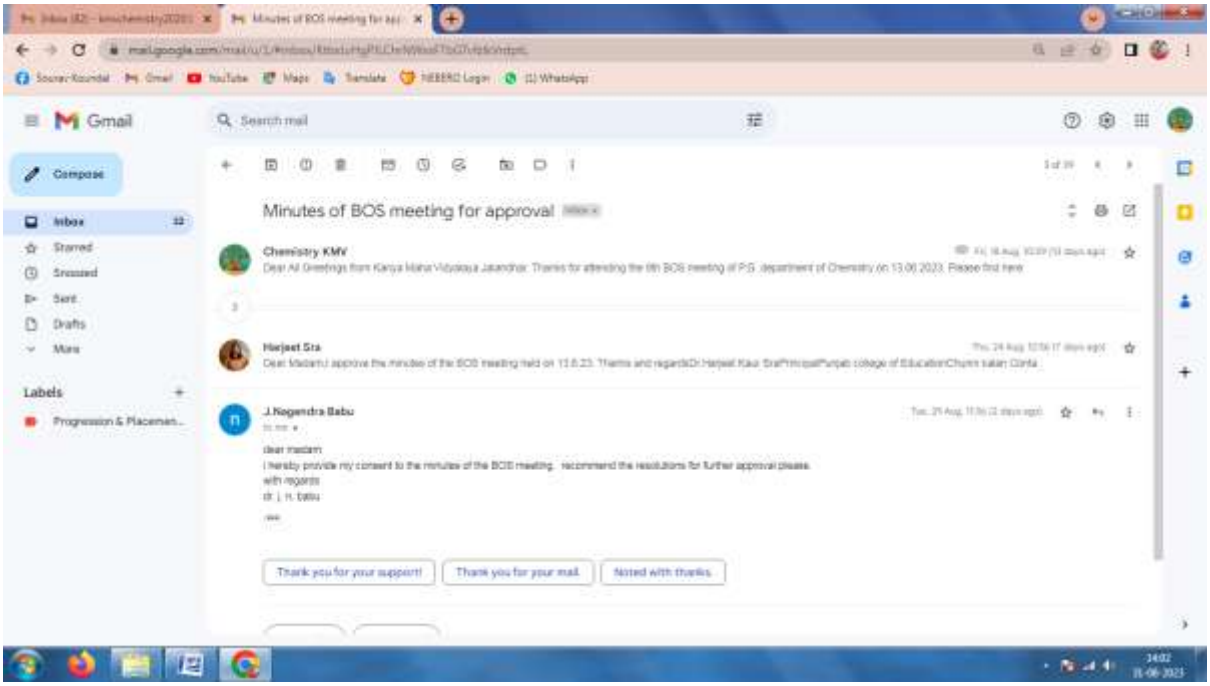
Gaurav
Dear Mam, I agree with the MoM. Gaurav Bhargava From: Chemistry KMV Sent: Friday, August 18, 2023 10:59 AM To:
Chemistry KMV
Thank you very much Sir for your prompt response. – Kanya Maha Vidyalaya, Jalandhar
vandana sharma
Dear Mam
I approve the proceedings.
Best regards
Vandana
Sent from Yahoo Mail on Android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Minutes of BOS meeting for approval
Chemistry KMV
Dear All Greetings from Kanya Maha Vidyalaya Jalandhar. Thanks for attending the 6th BOS meeting of P.G. department of Chemistry on 13.06.2023. Please find here
Harjeet Sra
Dear Madam,I approve the minutes of the BOS meeting held on 13.6.23. Thanks and regardsDr Harjeet Kaur SraPrincipalPunjabi college of EducationChunni kalan Distt
J.Nagendra Babu
dear madam
i hereby provide my consent to the minutes of the BOS meeting. recommend the resolutions for further approval please.
with regards
dr. j. n. babu
Thank you for your support!
Thank you for your mail.
Noted with thanks.

Action Taken Report (ATR)
On
Ninth Board of Studies Meeting held on 13-06-2023

Sr.No.	Agenda Item	Decision taken in Meeting	Action Taken
Chem: 2023: 9:1	To discuss and approve the minutes of Board of Studies held on 27.04.2022 and Action Taken Report.	Minutes of previous BOS meeting held on 27.04.2022 were approved by all BOS members.	Proceeding is confirmed.
Chem: 2023: 9:2	To discuss the Course scheme, Course Outcomes and proposed syllabi of papers of **Master of Science (Chemistry)** Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) with 30% internal assessment for the session 2023-24.	1)Master of Science (Chemistry) Semester I and II for session 2023-24 will have 52 credits. 2) Inter Disciplinary subjects offered will be optional and only grades will be assigned. 3) It was decided to add 20% internal assessment in all papers of **Master of Science (Chemistry)** Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24. 4) The credit of MCHM-113, Computer for Chemists was changed from 3 credits to 2 credits. So proportionately the syllabus was also decreased with the permission of the BOS members.	The approved syllabus is executed.
Chem: 2023: 9:3	To discuss the Course scheme, Course Outcomes and proposed syllabi of chemistry of class **Bachelor of Science** semester I to II, **Bachelor of Science (Biotechnology)** semester I, **Bachelor of Science (Hons) Maths** Semester I, **Bachelor of Science (Hons) Physics**	**1)In Bachelor of Science** semester I to II under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24, **Chemistry** subject will have 7 credits in each semester. It was decided to add 20% internal assessment in all papers of **Bachelor of Science**	The approved syllabus is executed.

	semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) with 30% internal assessment for the session 2023-24.	Semester I and II under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24. **2) In Bachelor of Science (Biotechnology)** semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24, **Chemistry** subject will have 6 credits in semester I. It was decided to add 20% internal assessment in all papers of **Bachelor of Science (Biotechnology)** Semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24. 3) **Bachelor of Science (Hons) Maths** has been changed to Five Years Integrated Program (FYIP) and renamed as **Master of Science (Mathematics) (FYIP)** Semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24, **Chemistry** subject will have 4 credits in semester I. It was decided to add 20% internal assessment in all papers of **Master of Science (Mathematics) (FYIP)** Semester I under Credit Based Continuous Evaluation Grading System (CBCEGS) for session 2023-24.	
Chem: 2023: 9:4	Syllabi with 20% internal assessment and list of examiners of papers of **Master of Science (Chemistry)**	All the BOS members approved the proposed Syllabi with 20% internal assessment and list of examiners of papers of	The approved syllabus is executed.

	Semester III and IV for the session 2023-24 will remain the same as session 2022-23 under Credit Based Continuous Evaluation Grading System and has already been approved.	**Master of Science (Chemistry)** Semester III and IV for the session 2023-24 under Credit Based Continuous Evaluation Grading System. The IDE in **Master of Science (Chemistry)** Semester III which was previously compulsory will now be optional.	
Chem: 2023: 9:5	The syllabi with 20% internal assessment and list of examiners of chemistry of class **Bachelor of Science** semester III to VI, **Bachelor of Science (Biotechnology)** semester III and VI, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Physics** semester III and IV for the session 2023-24 will remain the same as session 2022-23 under Continuous Evaluation Grading System and has already been approved. The syllabi of **Certificate course in Chemistry for Entrepreneurship and Production** for the session 2023-24 will remain the same as session 2022-23 under Credit Based Continuous Evaluation Grading System and has already been approved.	All the BOS members approved the proposed Syllabi with 20% internal assessment and list of examiners of chemistry of class **Bachelor of Science** semester III to VI, **Bachelor of Science (Biotechnology)** semester III and VI, **Bachelor of Science (Home Science)** semester III and IV, **Bachelor of Science (Hons) Physics** semester III and IV for the session 2023-24 under Continuous Evaluation Grading System and the syllabi of **Certificate course in Chemistry for Entrepreneurship and Production** for the session 2023-24 under Credit Based Continuous Evaluation Grading System.	The approved syllabus is executed.
Chem: 2023: 9:6	To discuss and approve list of proposed examiners for **Master of Science (Chemistry)**	All the BOS members approved list of proposed examiners for **Master of Science (Chemistry)**	List of Examiners was sent to COE Office.

	semester I and II, **Bachelor of Science** semester I and II, **Bachelor of Science (Biotechnology)** semester I, **Bachelor of Science (Hons) Maths** Semester I, **Bachelor of Science (Hons) Physics** semester I and II for the session 2023-24.	semester I and II, **Bachelor of Science** semester I and II, **Bachelor of Science (Biotechnology)** semester I, **Master of Science (Mathematics) (FYIP)** Semester I, **Bachelor of Science (Hons) Physics** semester I and II for the session 2023-24.	
Chem: 2023: 9:7	To discuss and approve the ordinance of **Bachelor of Science** and **Master of Science (Chemistry)** programmes.	The ordinance of **Bachelor of Science** and **Master of Science (Chemistry)** programmes was discussed and approved by the BOS members.	The approved ordinance is executed.
Chem: 2023: 9:8	To discuss research inputs and plans of the department for the session 2023-24.	Dr. Manju Sahni apprised the committee members about the research and future plans taken by the department for the research enhancement of faculty. She explained that department has five Ph. D teachers and two M.Sc teachers. Faculty members are engaged in quality research as evident from their publications in SCOPUS index Journals with high impact factors.	Dr. Narinderjit has registered three copyrights. She is also doing interdisciplinary project with Department of Fashion Designing under Seed Money grant of KMV. Tank Sinderpal Kabal Singh has published one research paper and one paper communicated in ESCI indexed Journals. Dr. Shikha, Dr. Swati and Tank Sinderpal Kabalsingh were allotted the seed money project by IQAC. The house highly appreciated the research work of the department.
Chem: 2023: 9:9	To discuss innovative teaching methodologies and evaluation adopted in the department and	Dr. Manju Sahni apprised the BOS members of teaching practices adopted in the Department. BOS	All the teachers are engaged in LMS online teaching, through

	inputs required to upgrade the same.	members appreciated the innovative teaching methodologies adopted by department like-ICT based teaching as Ppts, educational videos seminars leading to critical and creative thinking. She highlighted the departmental activities like quiz, workshops, educational trips and extension lectures from luminaries across globe is regular feature of department for overall development of students to create passion for science Other highlights of department include student-student mentoring, group discussions, student mentoring by teachers and remedial classes for weak students.	zoom app, uploading of video and audio recordings of different topics, through Google drive and YouTube.
Chem: 2023: 9:10	To discuss the result analysis for the session 2022-23.	BOS members appreciated the result of all classes	CO-PO mapping was done. Courses where CO attainment was not upto mark, in that new strategies like group discussions, seminars, powerpoint presentation, etc were conducted to increase students interest in the subject.
Chem: 2023: 9:11	To discuss and approve introduction of internship as optional course in Semester III of Master of Science (Chemistry) for the session 2023-24 under Credit Based Continuous Evaluation Grading System.	To inculcate professional skills, research aptitude and to have hands on training of the latest development in Chemistry, it was decided to introduce of internship as optional course in Semester III of Master of Science (Chemistry) for the session	The approved syllabus is on hold.

		2023-24 under Credit Based Continuous Evaluation Grading System. . All BOS members approved item **Chem: 2023: 9:11**	

Various departmental activities to upgrade the innovative teaching methodologies

Student internships

Sr.No.	Name of Student	Class	Roll No.
01	Navpreet Kaur	M.Sc Chemistry semester II	224952
02	Barjinder Kaur	M.Sc Chemistry semester II	224953
03	Arshdeep kaur	M.Sc Chemistry semester II	224954
04	Harleen Kaur	M.Sc Chemistry semester II	224956
05	Preeti	M.Sc Chemistry semester II	224958
06	Diksha Sharma	M.Sc Chemistry semester II	224960
07	Ankita Choudhary	M.Sc Chemistry semester II	224961
08	Nidhi	M.Sc Chemistry semester II	224962
09	Kritika Thakur	M.Sc Chemistry semester II	224963
10	Navika Dhiman	M.Sc Chemistry semester II	224964
11	Anchal Saroch	M.Sc Chemistry semester II	224965
12	Pooja Sharma	M.Sc Chemistry semester II	224966
13	Sakshi	M.Sc Chemistry semester II	224965
14	Tanvi kour	M.Sc Chemistry semester II	224969

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VRN No. 03401018527

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D.M.U./ [illegible] Dated 12.07.2023

TRAINING CERTIFICATE

This is to certify that Ms. Navpreet Kaur, Roll No. 224952, student of M.Sc (Chemistry), 2nd semester of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 16.06.2023 to 29.06.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(QR)

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IS : 15000
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THE DOABA COOPERTIVE MILK PRODUCERS' UNION LIMITED
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NO: VHD/ADMN/EA-1/2023/ 1402 DATE: 07/07/2023

TO WHOM IT MAY CONCERN

It is certified that Ms.Barjinder Kaur D/o Sh. Harjinder Singh, Roll No. 224953, Student of Master of Science (Chemistry) IInd Semester College of KANYA MAHA VIDYALAYA, Jalandhar-144004 has undergone In-Plant training from 20.06.2023 to 04.07.2023 at the Hoshiarpur District Co-operative Milk Producer's Union limited, Hoshiarpur, Verka Hoshiarpur Dairy. During the training period, her work and conduct remained satisfactory.

I wish her all the best for her future endeavor.

GENERAL MANAGER
Milk Union, Hoshiarpur

THE HOSHIARPUR DISTRICT COOPERATIVE MILK PRODUCERS UNION LIMITED
P.B. No. 17, Pin Code-146001, Verka Hoshiarpur Dairy Tel.: 01882-238157, PA to G.M. Ph.: 01882-239938
An ISO 22000-2005 Certified Unit, GSTIN : 03AABFT3731E1ZQ, PAN : AABFT3731E, E-mail : gm.hsp@verka.coop

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VRN No. 03401016527

D.M.U./Admn/3473

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Dated 8-07-2023

TRAINING CERTIFICATE

This is to certify that Ms. Arshdeep Kaur, Roll No. 224954, student of M.Sc (Chemistry), 2nd semester of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 21.06.2023 to 05.07.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge (H.R)

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Sun Pharma Laboratories Ltd.
Jammu Unit -1, 6-9, EPIP, Kartholi,
Bari Brahmana,
Jammu - 181 133, J & K, India.
Tel. : (91-923) 221010, 220931, 220932
CIN : U25200GJ1997PLC133846

SUN PHARMA

Ref. No. SUN/J/42/2023
Dtd: - 21st July 2023

Kanya Maha Vidyalaya,
Vidyalaya Marg,Jalandhar,
Punjab, Pin 144 004

Dear Sir,

This is to certify that **Ms. Harleen Kour D/o.** S. Kuldeep Singh Roll No 224956, letter reference No. KMV/672Dtd. 31/05/2023 a student of M.Sc. (Chemistry) was on a plant visit to our Bari Brahmana Plant from 16th June 2023 to 14th July 2023.

This is for your information.

For and on behalf of **Sun Pharma Laboratories Ltd.,**

Vinod Kashkari
HR Head

Sun Pharma Laboratories Ltd. * Jammu *

Registered Office: SPARC, Tandalja, Vadodara – 390 012, Gujarat, India.
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D.M.U./Admn/3869

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Dated 12-07-2023

TRAINING CERTIFICATE

This is to certify that Ms. Preeti, Roll No. 224958, student of M.Sc (Chemistry), 2nd semester of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 16.06.2023 to 29.06.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(HR)

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VRN No. 0340101802/

D.M.U./Adm/ 4117

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Dated 25/07/2023

TRAINING CERTIFICATE

This is to certify that Ms. Diksha Sharma, Roll No. 224960, student of M.Sc (Chemistry), of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 26.06.2023 to 10.07.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in different sections in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(HR)

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D.M.U./ Admn/ 4116

Dated 25/07/2023

TRAINING CERTIFICATE

This is to certify that Ms. Ankita, Roll No. 224961, student of M.Sc (Chemistry), of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 26.06.2023 to 10.07.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in different sections in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(HR)

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Dated...17.07.2023...

TRAINING CERTIFICATE

This is to certify that Ms. Nidhi, Roll No. 224962, student of M.Sc (Chemistry), 2nd semester of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 16.06.2023 to 29.06.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(QA)

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D.M.U./ [illegible] /1061

Dated 22-07-2023

TRAINING CERTIFICATE

This is to certify that Ms. Kritika Thakur, Roll No. 224963, student of M.Sc (Chemistry), of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 19.06.2023 to 06.07.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(HR)

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Dated 22-07-2023

TRAINING CERTIFICATE

This is to certify that Ms. Navika Dhiman, Roll No. 224964, student of M.Sc (Chemistry), of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 19.06.2023 to 06.07.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(HR)

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Nestlé India Limited
CIN: L15202DL1959PLC003786
POST BOX 11
LUDHIANA-FEROZEPUR ROAD
MOGA – 142 001, PUNJAB
Telephones:01636-512000/512103/512111
236280 to 236286
E-mail: corporate@in.nestle.com
Website: www.nestle.in

YOUR REF.: OUR REF.: PER/344/HK/SA DATE: 24.07.2023

To

The Training & Placement Officer,
Kanya Maha Vidyalaya
Jalandhar.

INPLANT TRAINING

This is to inform that **Ms. Anchal Saroch** of your institute has successfully completed her training in our organization from **21.06.2023 to 22.07.2023.**

She has submitted her project report in fulfillment of all the requirements of the Company Trainee Programme.

We appreciate her contributions and we will benefit from the outcome of her project recommendations. She displayed good team spirit and conducted herself in a professional manner.

We wish her great success in her career.

Nestlé India Limited
Moga Factory

Authorized Signatory

GSTIN 03AAATT0079M1Z5
ST/CST No. 33032616 Dt. 02-02-73
VRN No. 03601018027

D.M.U Admn/11052

verka
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Dated 22-07-2023

TRAINING CERTIFICATE

This is to certify that Ms. Pooja Sharma, Roll No. 224966, student of M.Sc (Chemistry), of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 19.06.2023 to 06.07.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge(HR)

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D.M.U.J./Admn./11659

Dated 22-07-2023

TRAINING CERTIFICATE

This is to certify that Ms. Sakshi, Roll No. 224967, student of M.Sc (Chemistry), of Kanya Maha Vidyalaya College, Jalandhar has completed her training from 19.06.2023 to 06.07.2023 in Milk Plant, Jalandhar. During the said period, she has completed her training in Quality Assurance section in respect of her degree and shown keen interest in obtaining the knowledge. During the course of training the work and conduct of the trainee found satisfactory.

Incharge (HR)

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Email: doabamilk_jal@yahoo.co.in

Troikk Health Care

S.No. 210

Date 31.07.2023

TO WHOM IT MAY CONCERN

This Is certified that Ms. Tanvi Kaur D/o Sh. Thakur Singh, Master of Science (Chemistry) Smester-II of **"Kanya Maha Vidalaya"** has undergone her industrial training in our oraganisation i.e. **M/s Troikk Healthcare** From 01.07.2023 to 31.07.2023 under technical guidance of our Plant Head Mr. Narindra Mohan Rathore.

Ms. Tanvi Kaur was provided with all facilities to have this training in all the production and testing section of our organization which she availed successfully.

We wish her all success in utilizing this training in his professional pursuits.

Authorized Signatory

TROIKK HEALTH CARE

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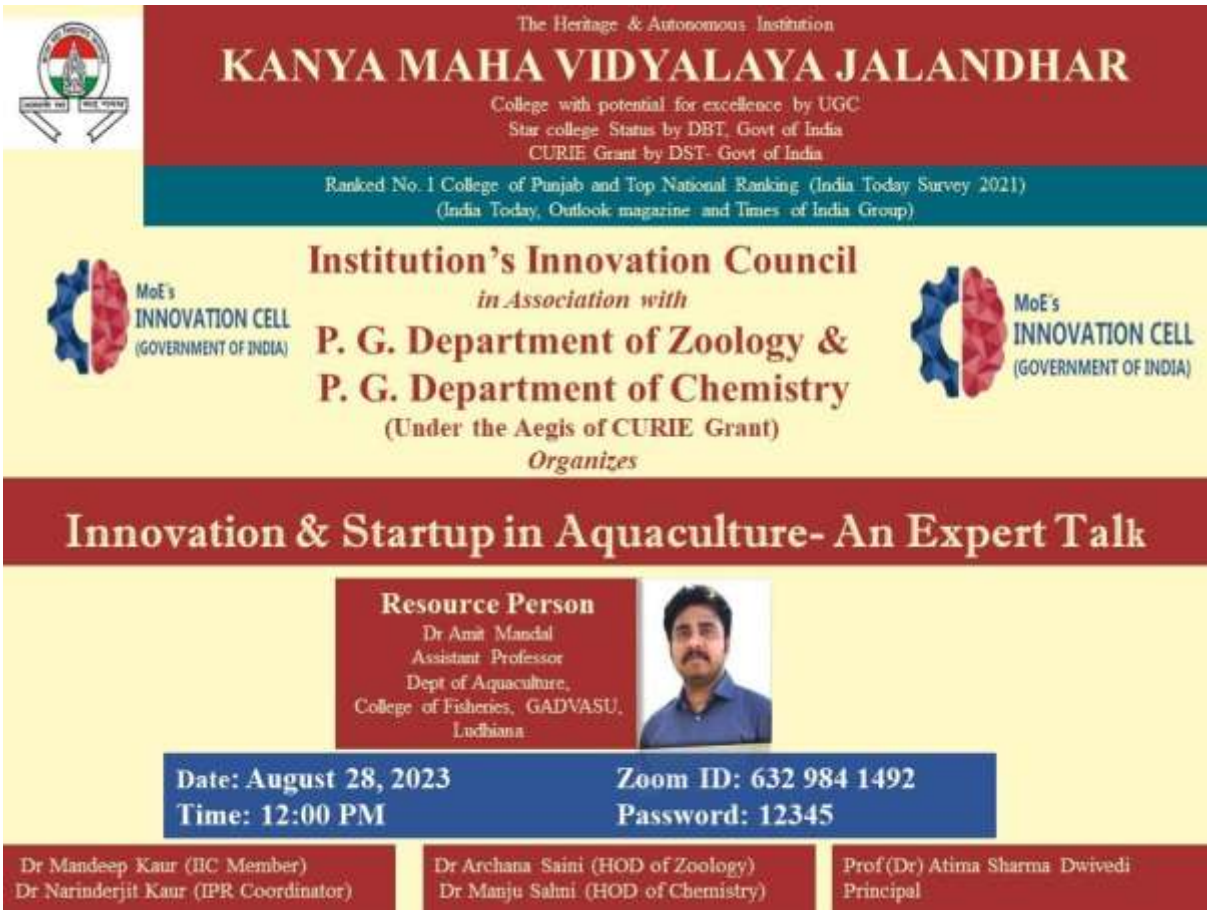
Activity 1. Name and details of seminars/webinars organized by department:

Title of the Seminar	Details like Number Name, designation and address of resource persons)	Dates	International/ National / Institution level	Number of participants
An Expert Talk – Innovation &Startup in Aquaculture	Dr. Amit Mandal, Assistant Professor,Dept. of Fisheries,GADVASU, Ludhiana	28.8.2023	National	50 https://docs.google.com/document/d/1CxlLNCQy6QppH8LTpKIza_eEc_ZrtH0n/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true



2. Name and details of workshops organized by department by Internal and External Resource Persons

Title of the Workshop	**If External, Details (name, designation and address of resource persons)**	**Dates**	**Number of participants**
One Day Workshop on "Entrepreneurship and Innovation as Career Opportunity"	Dr. T Pavan Kumar, Senior Scientist-Chemistry & IPR Ethics officer & secretary SEC &Coordinator for MAITRI Faculty at CSIR(IMMT), Bhubaneshwar	16.10.2023	300 https://docs.google.com/document/d/1ieQXIVN7KsaAApHNHVGxfUoWGJYrSttE/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true
Workshop on Entrepreneurship and StartUp	Mr. Shibananda Dash, Director of Startups& Innovations at MBCIE, a Hero group initiative	14.03.2024	76 https://docs.google.com/document/d/1Zvys-Fy9Y3gRPZGwmtpstFYw_9c67JHX/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true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Star College Status by DBT, Govt. of India
Top National Rankings (India Today, Outlook Magazine & Times of India Group)
INSTITUTION'S INNOVATION COUNCIL
Institution's Innovation Council
in association with
MoE's INNOVATION CELL (GOVERNMENT OF INDIA)
PG Dept. of Chemistry
Organizes
Workshop on
Entrepreneurship & Innovation
as Career Opportunity
Dr T Pavan Kumar
Senior Scientist – Chemistry & IPR
Ethics Officer & Secretary - Standing Ethics Committee SEC; Coordinator-MAITRI
Faculty-CSIR (IMMT), Bhubaneswar
All Participants will get e-certificates
Free Registration:
https://forms.gle/N49wF6zCACamZEm86
Zoom ID: 589 144 9954;
Password: 123456
Dr. Narinderjit Kaur
Incharge, KMV IPR Cell, IPR Activity Coordinator
Prof. (Dr.) Atima Sharma Dwivedi
Principal, Kanya Maha Vidyalaya, Jalandhar


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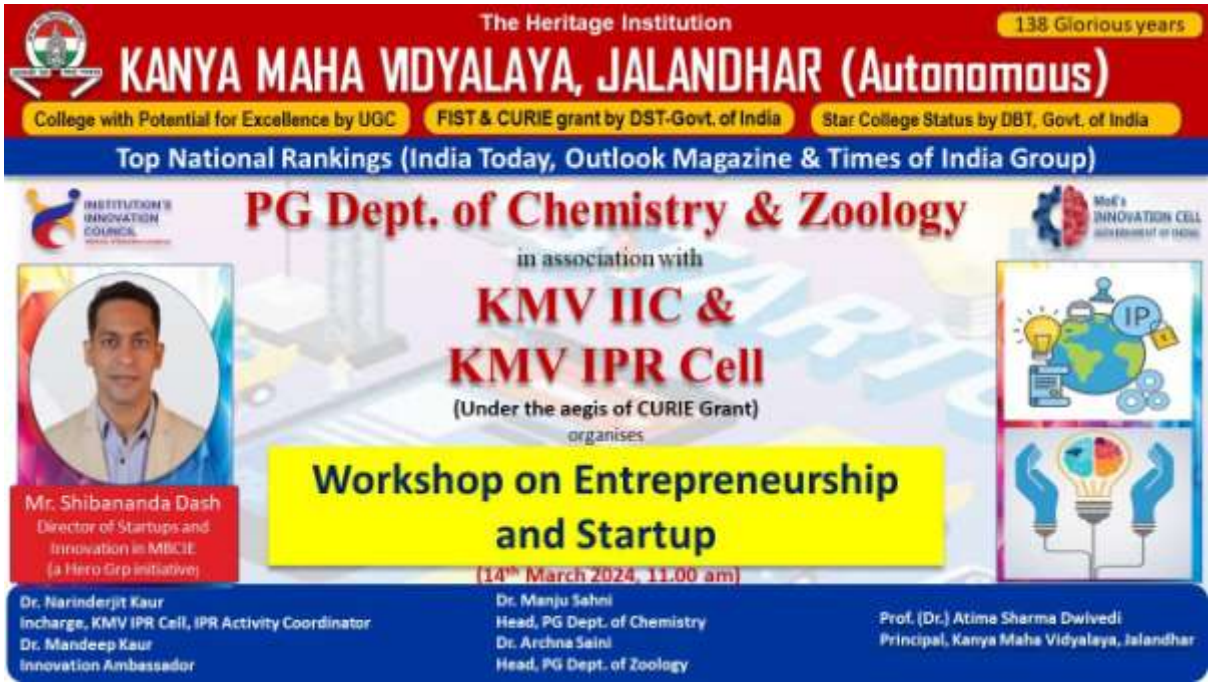
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Star College Status by DBT, Govt. of India
Top National Rankings (India Today, Outlook Magazine & Times of India Group)
PG Dept. of Chemistry & Zoology
in association with
KMV IIC &
KMV IPR Cell
(Under the aegis of CURIE Grant)
organises
Workshop on Entrepreneurship and Startup
(14th March 2024, 11.00 am)
Mr. Shibananda Dash
Director of Startups and Innovation in MBCIE (a Hero Grp initiative)
Dr. Narinderjit Kaur
Incharge, KMV IPR Cell, IPR Activity Coordinator
Dr. Mandeep Kaur
Innovation Ambassador
Dr. Manju Sahni
Head, PG Dept. of Chemistry
Dr. Archna Saini
Head, PG Dept. of Zoology
Prof. (Dr.) Atima Sharma Dwivedi
Principal, Kanya Maha Vidyalaya, Jalandhar


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Entrepreneurship and
Startups

3. Name and details of extension lectures organized by department

Title of the Extension lecture	**Details (name, designation and address of resource persons)**	**Date**	**Number of participants**
Extension Lecture on " Career Counselling in Sciences "	Dr.VandanaBhalla Professor, Dept. of Chemistry, Guru Nanak Dev University, Amritsar	09.03.2024	50 https://docs.google.com/document/d/1x-32di9QAjSv1cMLtitR9QqoZCdYkfES/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true

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Top National Rankings (India Today, Outlook Magazine & Times of India Group)

PG Dept. of Chemistry

organizes

"Career Counselling in Science"

(9th March, 2024)

Under the aegis of CURIE Grant (DST Govt. of India)

Prof. Dr. Vandana Bhalla
Guru Nanak Dev Universty, Amritsar
Specialization : Supramolecular Chemistry

Dr. Manju Sahni
Head, PG Dept. of Chemistry

Prof. (Dr.) Atima Sharma Dwivedi
Principal, Kanya Maha Vidyalaya, Jalandhar


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Departmental Activities

Sr. No	Name of the event	Details of event	Dates	Number of participants
1.	Poster Presentation Competition on Start-Up's and linkage with Innovation ambassadors	P.G Dept of Chemistry and P G Department of Zoology of KanyaMahaVidyalaya, Jalandhar in collaboration with Institution's Innovative Council organised Poster Presentation competition under the theme of Start-ups & linkage with Innovation Ambassadors for mentorship support on August 22, 2023 under YUKTI program, an initiative of Government of India. The competition was held in offline mode to give a platform to the participants to showcase their idea/start up to get desired support or external visibility with the support of the Institute Innovation Ambassadors. The Innovation Ambassadors Dr Narinderjit Kaur and Dr Mandeep Kaur provided mentorships to the students on innovation and how the projects and ideas can be used to develop the startup.	22.08.2023	50 https://docs.google.com/document/d/1IoV_DnfRGhyeOU398Aqvv2xc4MUMOw5u/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true
2.	World Rose Day	PG Department of Chemistry, KanyaMahaVidyalaya- the Heritage and Autonomous Institution, Jalandhar organized creative and innovative national level competitions on World Rose Day dated 22nd September 2023 under the aegis of CURIE grant. The world rose day is celebrated to spread awareness, give hope and to cheer the people fighting from cancer. The event was organized in hybrid mode i.e. both offline and online mode. Before starting the event, all the participants and teachers were felicitated with pink ribbon. During this event, entitled "**Welfare of Cancer Patients"** more than 200 students across the country participated with full enthusiasm. Competitions such as card making and video message on Cancer awareness were held.	22.09.2023	58 https://docs.google.com/document/d/1KLXtQr7ySdQHwZ6rujfRmmKL8x_sW0mQ/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true

3.	Chem- Innovesta (Screening for Open House GNDU competition)	In a resounding celebration of academic and creative excellence, P.G Department of Chemistry at KanyaMahaVidyalaya recently organized "Chem-Innovesta," a multifaceted event showcasing the intellectual and innovative spirit of the students. The event was held under the dynamic leadership of Principal Professor Dr.Atima Sharma Dwivedi.and spearheaded by the Head & Associate Professor of the P.G. Department of Chemistry, witnessed enthusiastic participation and a vibrant display of talents. The Chem-Innovesta event comprised various activities aimed at fostering a holistic learning environment. Paper reading sessions provided students with a platform to delve deep into their research findings, sharing insights into the latest developments in the field of chemistry.	04.10.2023	51 https://docs.google.com/document/d/1KyroDE-aFVo4PM_AVquLA8cYcfFSyF38/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true
4.	Open House 2023- GNDU, Amritsar	Students of PG Department of Chemistry, KanyaMahaVidyalaya - the Heritage and Autonomous Institution, Jalandhar, under the aegis of CURIE grant participated in INTER-University/Inter College/Inter-Collegiate competition in "OPEN-HOUSE 2023" competition organized by Chemical Society, Department of Chemistry, Guru Nanak Dev University in collaboration with American Chemical Society and District Education Office, Amritsar on 6th October 2023. The event was based on the theme "**Chemistry for better living**" and had several competitions including Rangoli making, Quiz,Paper reading and university students also displayed their research posters and other research showcases in the campus for the visitors. Students put their chemistry skills to the test in a fierce competition filled with experiments, challenges and innovative ideas.18 PG students of Dept. of chemistry, KMV has visited labs in	06.10.2023	34 https://docs.google.com/document/d/1TvwtQBxK9A9h_AUpVEPdiRVWmRZjzLuB/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true

		Chemistry department, GNDU and learnt various instrumentation techniques like NMR,X-Ray Crystallography and many more.		
5.	Visit to NIT, Jalandhar	In an endeavor to foster academic excellence and provide an enriching learning experience, the Postgraduate Department of Chemistry at KanyaMahaVidyalaya organized a visit to the prestigious National Institute of Technology, Jalandhar, for its M.Sc Chemistry students. The visit, held on 14th October 2023, aimed to expose students to the latest advancements in instrumentation within the realm of chemistry. The students were provided with a unique opportunity to witness state-of-the-art laboratories and interact with leading experts in the field. The visit included insightful sessions on cutting-edge instrumentation, where students gained first hand knowledge about the latest technologies shaping the landscape of chemical research.	14.10.2023	16 https://docs.google.com/document/d/1fuoezILIxI5_59EofAkoxh625fCHzmnF/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true
6.	Educational Trip to Punjab Agricultural University, Ludhiana	In a stride towards enriching the academic experience for the postgraduate students pursuing M.Sc Chemistry, KanyaMahaVidyalaya organized an educational visit to Punjab Agricultural University, Ludhiana. The visit aimed at providing students with firsthand exposure to cutting-edge research facilities and fostering a deeper understanding of their field. The students embarked on a comprehensive tour of the university, exploring various laboratories and immersing themselves in the research environment. The visit was structured to encompass diverse aspects of chemistry, allowing the students to witness practical applications and advancements in their field of study.	16.10.2023	16 https://docs.google.com/document/d/18s8epylLTTAsgJvVf09AAsPqMDG0O1ZD/edit?usp=drive_link&ouid=113416712339352885 05

		The laboratories showcased state-of-the-art equipment, experimental setups, and ongoing research projects, offering invaluable insights into the practical dimensions of the subject.		1&rtpof=true&sd=true
7.	National Chemistry Week	PG and UG students along with faculty members under the esteemed guidance of Principal Professor Dr.Atima Sharma Dwivedi and the leadership of Head and Associate Professor of the P.G. Department of Chemistry, Dr.ManjuSahni, hosted a spectacular event to commemorate National Chemistry Week. From 15th to 21st October 2023, the department was abuzz with engaging activities and competitions that showcased the students' passion for chemistry.	15.10.2023-21.10.2023	148 https://docs.google.com/document/d/1QcS_4eq1GmfXtJx29rXP7WACjfpVQ8AE/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true
8.	Fun Games Stall in Diwali Exhibition	Postgraduate Department of Chemistry, under the guidance of Principal Dr.Atima Sharma Dwivedi, organized a lively and engaging fun games stall at the Diwali Exhibition held on November 4th, 2023. The stall featured a variety of exciting games such as **"Flip the Bottle," "Play with Rings," and "Pick Up from Straw,"** designed to entertain and engage school and college students attending the event. The enthusiastic participation of the Postgraduate students and faculty made the games even more enjoyable for everyone.	04.11.2023	20 https://docs.google.com/document/d/1awnzdbW4qHF5gdhU0I2YONDOsBlyPQ8M/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true

9.	National Level Quiz (Marie Curie)	P.G Department of Chemistry, KanyaMahaVidyalaya, under the esteemed guidance of Principal Professor Dr.Atima Sharma Dwivedi, organized a remarkable event to commemorate the birth anniversary of the renowned scientist, Marie Curie. The National Quiz, held on 7th November 2023 showcased the brilliance and inquisitiveness of students in the field of science. The event aimed to honor the contributions of Marie Curie, a pioneer in the field of radioactivity and the first woman to win a Nobel Prize. The National Quiz provided a platform for students from various educational institutions to showcase their knowledge and passion for science.	07.11.2023	110 https://docs.google.com/document/d/1kZdkpc4DtFt2EYTzXVFkS06QJMxLTvba/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true
10.	"Bonding through Brushes" : Chemistry inspired Wall Art	PG Dept. of Chemistry, KanyaMahaVidyalaya, Jalandhar, recently hosted a remarkable event **"Bonding with Brushes"** that brought together the world of science and art. The Chemistry Inspired Wall Art held on November 9th and 10th, 2023, showcased the incredible talent and creativity of our faculty and students. The event featured a wide range of captivating art pieces, all inspired by various chemical concepts and elements. From vibrant paintings to intricate sculptures, the exhibition displayed the beauty and imagination that can be found in the field of chemistry.	09.11.2023-10.11.2023	54 https://docs.google.com/document/d/1guvqCt7eejd3-yXK6kglURupkuWyvrLG/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true

11.	Food Adulteration Camp & Tree Plantation Drive Govt. P.A.P Smart School, Jalandhar	P.G Department of Chemistry at KanyaMahaVidyalaya (KMV) took a resolute step towards fostering awareness against food adulteration and nurturing environmental sustainability through a commendable dual initiative on February 20, 2024. Under the astute guidance of Dr.ManjuSahni, Head of the P.G. Department of Chemistry, KMV, a pioneering food adulteration camp was organized at Govt. P.A.P Smart School, Jalandhar. The event served as a platform for students to delve into practical experiments aimed at identifying adulterants in commonly used food items such as milk, spices, and others. These experiments, crafted ingeniously using simple household items, empowered students to detect adulteration, thereby promoting consumer awareness and food safety.	20.02.2024	6 https://drive.google.com/drive/folders/1SalYlp7kjgP7dfeZsGIHRmHGbYITORNR?usp=drive_link
12.	Chemistry Stall "Crazy Chemical Creations" in National Science Day	Department of Science at KanyaMahavidyalaya Jalandhar, in collaboration with KMV IIC, celebrates National Science Day annually to raise awareness of the value of science and its contributions to society. Indigenous technologies for Viksit Bharat was the topic of this year's National Science Day celebration.Each year on February 28, India celebrates National Science Day in honor of scientist Sir ChandrasekharaVenkata Raman, sometimes known as C.V. Raman, who discovered the "Raman Effect." The event provides a forum for recognizing and educating the public about the contributions made by the scientific community to the advancement of our country. Department of Chemistry	27.02.2024	100 https://drive.google.com/drive/folders/1nta3luySTmubAd5PDgoCBbOXAum0kQ3a?usp=drive_link

		demonstrated their scientific prowess through captivating experiments including Elephant Toothpaste, Secret Messages, Chemical Chameleon, Chemical Volcano, Power of Indicators, and various food adulteration experiments.		
13.	e-Poster making competition of start-up ideas & Linkage with Innovation Ambassadors for mentorship program	P.G Dept of Zoology and P G Department of Chemistry of KanyaMahaVidyalaya, Jalandhar in collaboration with Institution's Innovative Council organised E- Poster Presentation competition under the theme of Innovation/ Prototype & linkage with Innovation Ambassadors for mentorship support on February 29, 2024. The competition was held in offline mode to give a platform to the participants to showcase their innovation ideas to get desired support or external visibility with the support of the Institute Innovation Ambassadors. The Innovation Ambassadors Dr Mandeep Kaur, Dr Prabha and Dr Narinderjit Kaur and provided mentorships to the students on innovation and how the projects and ideas can be used for innovation. The primary mandate was to encourage, inspire and nurture young students by supporting them to work with new ideas. Around 80 plus students participated in this event and demonstrated of their innovative ideas having potential for start-ups.	29.02.2024	80 https://docs.google.com/document/d/1w7WUdWJpvznLsNKHpDmvfKhFBabRSF1n/edit?usp=drive_link&ouid=113416712339352885051&rtpof=true&sd=true
14.	One Day Training Program on "Characterization of Soft Materials" in NIT Jalandhar.	The students of P.G Department of Chemistry from KanyaMahaVidyalaya (The Heritage and Autonomous Institiution), Jalandhar participated in a dynamic **One-day training session on the Characterization of Soft Materials**. The event, sponsored by SERB (Science and Engineering Research Board) under the Scientific Science Responsibility Policy, was expertly coordinated by Dr.Parveen	09.03.2024	19 https://docs.google.com/document/d/1HtUP0kzQqSUFi1bLmG7H7lrYHXaev7qI/edit?usp=drive_link&ouid=113416712339352

		Malik at the prestigious Dr. B. R. Ambedkar National Institute of Technology in Jalandhar.		885051&rtpof=true&sd=true


SUPPORT

ਕੇਐੱਮਵੀ 'ਚ ਯੁਕਤੀ ਪ੍ਰੋਗਰਾਮ ਤਹਿਤ ਪੋਸਟਰ ਪੇਸ਼ਕਾਰੀ ਮੁਕਾਬਲਾ

ਸੀਨੀਅਰ ਸਟਾਫ ਰਿਪੋਰਟਰ, ਜਲੰਧਰ : ਕੇਐੱਮਵੀ ਦੇ ਪੋਸਟ ਗ੍ਰੈਜੂਏਟ ਕੈਮਿਸਟਰੀ ਵਿਭਾਗ ਤੇ ਪੋਸਟ ਗ੍ਰੈਜੂਏਟ ਜ਼ੂਆਲੋਜੀ ਵਿਭਾਗ ਵੱਲੋਂ ਭਾਰਤ ਸਰਕਾਰ ਦੇ ਯੁਕਤੀ ਪ੍ਰੋਗਰਾਮ ਤਹਿਤ ਇੰਸਟੀਚਿਊਸ਼ਨਜ਼ ਇਨੋਵੇਸ਼ਨ ਕੌਂਸਲ ਦੇ ਸਹਿਯੋਗ ਨਾਲ ਪੋਸਟਰ ਪੇਸ਼ਕਾਰੀ ਮੁਕਾਬਲਾ ਕਰਵਾਇਆ ਗਿਆ। ਸਟਾਰਟਅਪ ਐਂਡ ਲਿੰਕੇਜ ਵਿਦ ਇਨੋਵੇਸ਼ਨ ਅੰਬੈਸਡਰਜ਼ ਫਾਰ ਮੈਂਟਰਸ਼ਿਪ ਸਪੋਰਟ ਥੀਮ ਤਹਿਤ ਕਰਵਾਏ ਗਏ ਇਸ ਮੁਕਾਬਲੇ 'ਚ 100 ਤੋਂ ਵੱਧ ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਉਤਸ਼ਾਹ ਨਾਲ ਭਾਗ ਲਿਆ। ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਨੋਵੇਸ਼ਨ ਡਿਵੈੱਲਪਮੈਂਟ ਤੇ ਸਟਾਰਟਅਪ ਦੀ ਪ੍ਰਕਿਰਿਆ ਬਾਰੇ ਸਮਝਣ ਦੇ ਨਾਲ-ਨਾਲ ਉਨ੍ਹਾਂ ਦੇ ਵਿਚਾਰਾਂ ਨੂੰ ਸਫਲ ਪ੍ਰੋਗਰਾਮਾਂ 'ਚ ਬਦਲਣ ਤੇ ਸਫਲ ਪ੍ਰਦਰਸ਼ਨ ਲਈ ਇਕ ਪਲੇਟਫਾਰਮ ਪ੍ਰਦਾਨ ਕਰਨ ਦੇ ਉਦੇਸ਼ ਨਾਲ ਕਰਵਾਏ ਇਸ ਮੁਕਾਬਲੇ ਨੇ ਨੌਜਵਾਨ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਆਪਣੇ ਵਿਚਾਰਾਂ ਨੂੰ ਬਦਲਣ ਦਾ ਮੌਕੇ ਤੋਂ ਇਲਾਵਾ ਪਰਿਵਰਤਨ ਲਈ ਸਮਰਥਨ ਤੇ ਉਤਸ਼ਾਹ

100 ਤੋਂ ਵੱਧ ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਉਤਸ਼ਾਹ ਨਾਲ ਹਿੱਸਾ ਲਿਆ, ਪ੍ਰਿੰਸੀਪਲ ਪ੍ਰੋ. ਦਿਵੇਦੀ ਨੇ ਅਹਿਮ ਮੁੱਦਿਆਂ 'ਤੇ ਕੀਤੀਆਂ ਵਿਚਾਰਾਂ

ਪ੍ਰਦਾਨ ਕਰਨ 'ਤੇ ਵਿਸ਼ੇਸ਼ ਧਿਆਨ ਦਿੱਤਾ ਗਿਆ। ਪ੍ਰਿੰਸੀਪਲ ਪ੍ਰੋ. ਅਤਿਮਾ ਸ਼ਰਮਾ ਦਿਵੇਦੀ ਇਸ ਮੌਕੇ ਵਿਦਿਆਰਥਣਾਂ ਵੱਲੋਂ ਪੇਸ਼ ਕੀਤੇ ਗਏ ਬਹੁਤ ਹੀ ਪ੍ਰਭਾਵਸ਼ਾਲੀ ਪੋਸਟਰਾਂ ਦੀ ਸ਼ਲਾਘਾ ਕਰਦਿਆਂ ਕਿਹਾ ਕਿ ਅਜਿਹੀਆਂ ਗਤੀਵਿਧੀਆਂ ਰਾਹੀਂ ਵਿਦਿਆਰਥੀ ਇਨੋਵੇਸ਼ਨ ਨਾਲ ਸਬੰਧਤ ਗਿਆਨ ਤੇ ਜਾਣਕਾਰੀ ਪ੍ਰਾਪਤ ਕਰਕੇ ਆਪਣੇ ਕੰਮ ਦੌਰਾਨ ਪੈਦਾ ਹੋਣ ਵਾਲੀ ਕਿਸੇ ਵੀ ਸਮੱਸਿਆ ਨੂੰ ਆਸਾਨੀ ਨਾਲ ਹੱਲ ਕਰ ਸਕਦੇ ਹਨ, ਉੱਥੇ ਹੀ ਉਨ੍ਹਾਂ 'ਚ ਸਮੱਸਿਆ ਹੱਲ ਕਰੰਨ ਦੇ ਹੁਨਰ ਵੀ ਵਿਕਸਿਤ ਹੁੰਦੇ ਹਨ। ਨਾਲ ਹੀ ਉਨ੍ਹਾਂ ਨੇ ਇਸ ਨੂੰ ਸਫਲ ਕਰਵਾਉਣ ਲਈ ਇਨੋਵੇਸ਼ਨ ਅੰਬੈਸਡਰ ਡਾ. ਨਰਿੰਦਰਜੀਤ ਕੌਰ ਤੇ ਡਾ. ਮਨਦੀਪ ਕੌਰ ਦੇ ਨਾਲ-ਨਾਲ ਕੈਮਿਸਟਰੀ ਤੇ ਜ਼ੂਆਲੋਜੀ ਵਿਭਾਗ ਵੱਲੋਂ ਕੀਤੇ ਗਏ ਯਤਨਾਂ ਦੀ ਵੀ ਸ਼ਲਾਘਾ ਕੀਤੀ।

ਪੋਸਟਰ ਪੇਸ਼ਕਾਰੀ ਮੁਕਾਬਲੇ ਦੌਰਾਨ ਕੇਐੱਮਵੀ ਦੀਆਂ ਵਿਦਿਆਰਥਣਾਂ।


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PG Department of Chemistry
(Under the aegis of CURIE grant)
Organizes
National Level Competitions
to celebrate
World Rose Day
(22nd September 2023)
WORLD ROSE DAY
September 22
Convener: Dr. Manju Sahni
Head, PG Dept. of Chemistry
Coordinator: Dr. Narinderjit Kaur
IPR activity Coordinator, Incharge-KMV IPR Cell
Prof. (Dr.) Atima Sharma Dwivedi
Principal, Kanya Maha Vidyalaya, Jalandhar


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DAY
2023
October 6th 2023
10:00 AM – 5:00 PM
THEME:
CHEMISTRY FOR BETTER LIVING
• Rangoli Competitions
• Quiz Competition
• Paper Reading

गुरु नानक देव यूनिवर्सिटी के केमिस्ट्री विभाग ने करवाई प्रतियोगिता

इंटर यूनिवर्सिटी ओपन हाउस प्रतियोगिता में महिला कॉलेज की छात्राएं रहीं फर्स्ट

भास्कर न्यूज | जालंधर

गवर्नमेंट महिला कॉलेज के केमिस्ट्री विभाग की छात्राओं ने वीरवार को इंटर यूनिवर्सिटी ओपन हाउस प्रतियोगिता में शानदार प्रदर्शन किया। इ स प्रतियोगिता का आयोजन गुरु नानक देव यूनिवर्सिटी अमृतसर के केमिस्ट्री विभाग के सहयोग से केमिकल सोसायटी ने किया था। जिसमें केएमवी कि छात्राओं ने क्विज, पेपर रीडिंग, रंगोली प्रतियोगिता में जोश व उत्साह के साथ भाग लेकर कॉलेज का नाम रोशन किया है। बनप्रीत कौर, मानसी, रूपिंदर कौर और तन्वी की टीम ने इंटर कॉलेज रंगोली प्रतियोगिता में पहला स्थान प्राप्त किया। वहीं क्विज प्रतियोगिता में मनवीन, आकृति तथा बीनु कुमारी की टीम पहला स्थान पाया।

एमवी कॉलेज के विद्यार्थी के साथ प्रबंधक।

इसके अलावा केएमवी कॉलेजिएट सीनियर सेकेंडरी स्कूल की सुचित्रा, भानु सारदा और मनप्रीत ने इंटर स्कूल रंगोली प्रतियोगिता में से पहला स्थान हासिल किया।जानकारी के अनुसार केएमवी के केमिस्ट्री विभाग की 18 छात्राओं ने यूनिवर्सिटी के केमिस्ट्री विभाग और प्रोगशाला विजिट की। विजिट के दौरान छात्राओं ने एमआर, एक्स रे, क्रिस्टलोग्राफी आदि की जानकारी जुटाई। स्कूल की प्रिंसिपल प्रो. अतिमा शर्मा द्विवेदी ने छात्राओं की इस उपलब्धि प्राप्त करने के लिनए बधाई दी और भविष्य में भी इस प्रकार की प्रतियोगिताओं का हिस्सा बनने के लिए प्रेरित किया।मौके पर केमिस्ट्री विभागा की अध्यक्ष डॉ. मंजू साहनी समेत अन्य भी उपस्थित रहे।

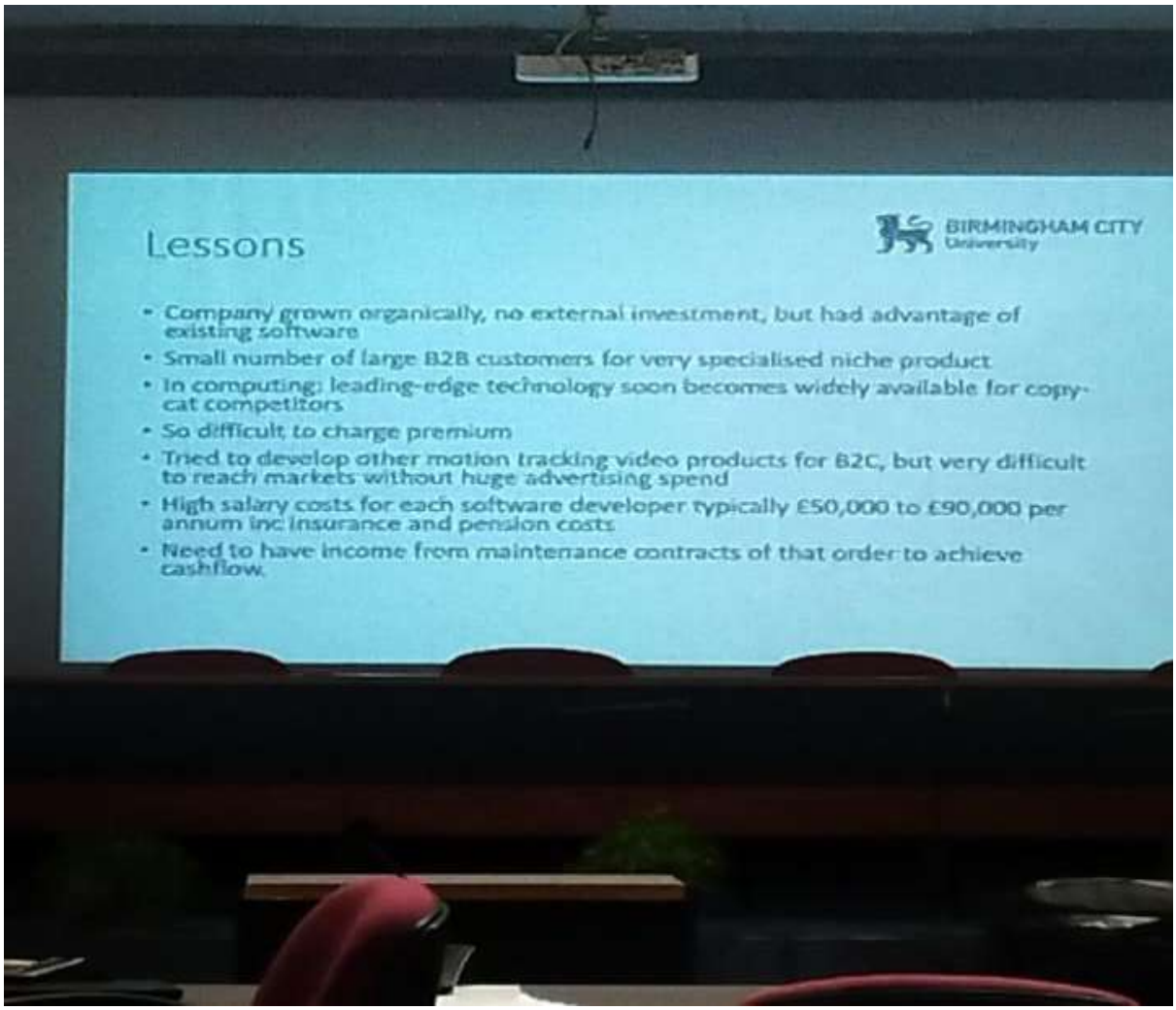
'इंटर यूनिवर्सिटी, कालेज व कालेजिएट के ओपन हाऊस मुकाबले में चमकीं के.एम.वी. की छात्राएं'

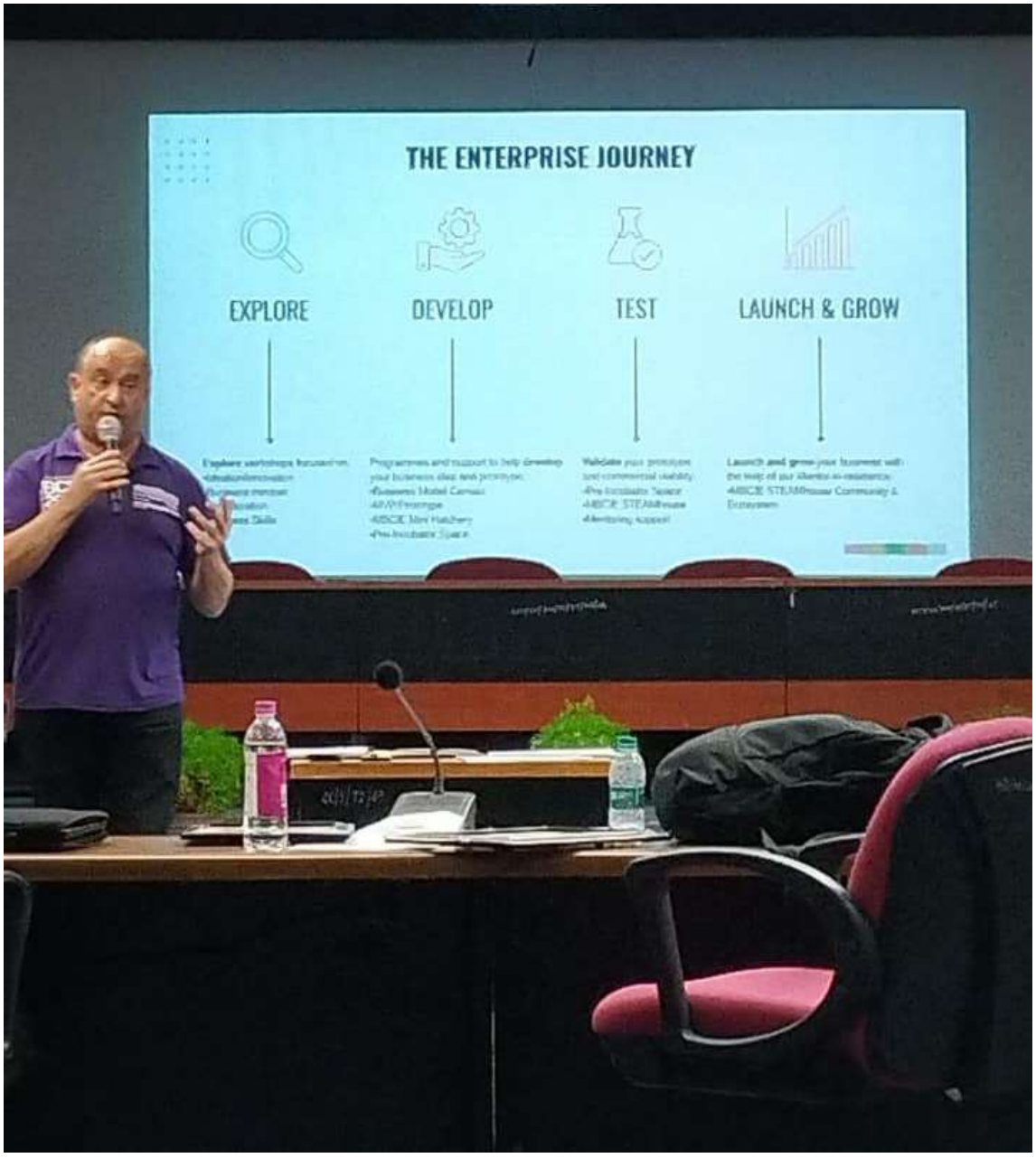
कालेज की मेधावी छात्राओं को पुरस्कृत करतीं प्रिंसीपल प्रो. आतिमा शर्मा व फैकल्टी स्टाफ। (ठाकुर)

जालंधर, 23 नवंबर (विनीत): कन्या महाविद्यालय के पोस्ट ग्रैजुएट डिपार्टमैंट ऑफ कैमिस्ट्री की छात्राओं ने क्यूरी ग्रांट के तहत इंटर यूनिवर्सिटी, इंटर कालेज व इंटर कालेजिएट ओपन हाउस-2023 में भाग लेकर कालेज का नाम रौशन किया।

गुरु नानक देव यूनिवर्सिटी, अमृतसर के कैमिस्ट्री विभाग के तहत कैमिकल सोसाइटी की ओर से अमेरिकन कैमिकल सोसायटी व जिला शिक्षा अफसर, अमृतसर के सहयोग से हुए उक्त कार्यक्रम में 'कैमिस्ट्री फार बैटर लिविंग' विषय पर हुई पेपर रीडिंग, क्विज व रंगोली प्रतियोगिता में कालेज की छात्राओं ने बढ़चढ़ कर भाग लिया, जिसके तहत कालेज की छात्रा बबनप्रीत कौर, मानसी, रुपिन्द्र कौर व तनवी की टीम ने इंटर कालेज रंगोली प्रतियोगिता, क्विज में मनवीन कौर, आकृति व बीनू की टीम तथा के.एम.वी. कालेजिएट स्कूल की छात्रा सुचित्रा, भानू शारदा व मनप्रीत ने इंटर स्कूल रंगोली मुकाबले में पहला स्थान हासिल किया।

इसके साथ ही कालेज के कैमिस्ट्री विभाग की 18 छात्राओं ने यूनिवर्सिटी के कैमिस्ट्री विभाग व लैबोरेट्री का भी दौरा किया तथा वहां मौजूद एन.एम.आर., एक्स-रे, क्रिस्टलोग्राफी संबंधी जानकारी हासिल की। प्रिंसीपल प्रो. आतिमा शर्मा व डा. मंजू साहनी ने विजेताओं को बधाई दी।


Lessons
BIRMINGHAM CITY University
• Company grown organically, no external investment, but had advantage of existing software
• Small number of large B2B customers for very specialised niche product
• In computing: leading-edge technology soon becomes widely available for copy-cat competitors
• So difficult to charge premium
• Tried to develop other motion tracking video products for B2C, but very difficult to reach markets without huge advertising spend
• High salary costs for each software developer typically £50,000 to £90,000 per annum inc insurance and pension costs
• Need to have income from maintenance contracts of that order to achieve cashflow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is organizing various events to commemorate

NATIONAL CHEMISTRY WEEK

(October 15 – 21, 2023)

Theme:

THE HEALING POWER OF CHEMISTRY

1. Chemiglow: Rangoli

2. ChemQuest: Paper Reading

3. FUN Quiz (Kahoot)

4. Chem Brainee: Quiz

- Last date to submit your entries for Rangoli (your pic with Rangoli on above theme) 20th October 2023. send your entries at: **kmvchemactivities22@gmail.com**
- Mention your name, class, roll number, institution
- Results will be declared on 22 Oct 2023

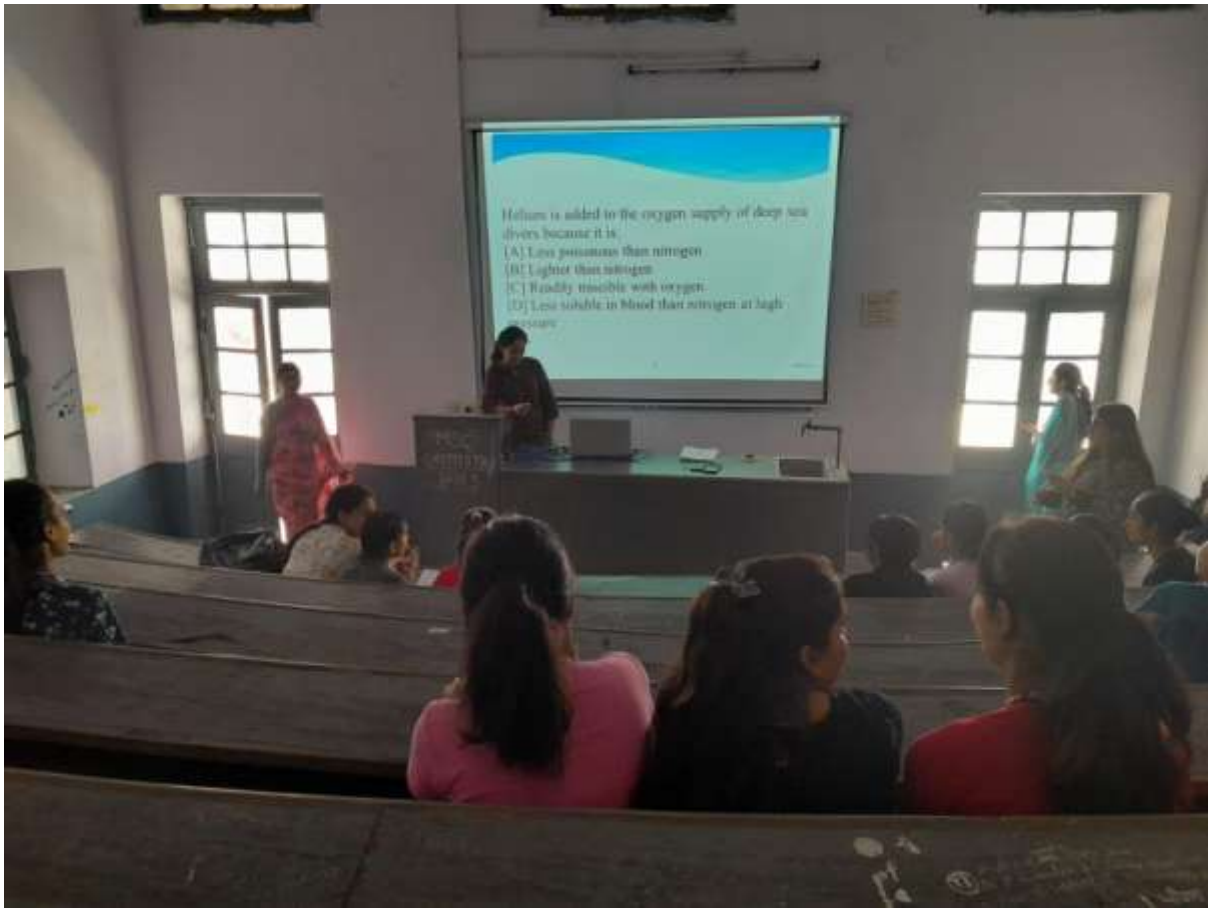
Free registration: https://forms.gle/pV2cpJn849HodhHE9

For FUN QUIZ Join Zoom on 20th October 2023 at 2.00 pm

Zoom Meeting ID: 73840495940 Passcode: 92G77Q

Convener:	Co-ordinator:	Principal:
Dr. Manju Sahni	Dr. Narinderjit Kaur	Prof. (Dr.) Atima Sharma Dwivedi


NCW 2023
CHEMI
GLOW


Helium is added to the oxygen supply of deep sea
divers because it is
[A] Less poisonous than nitrogen
[B] Lighter than nitrogen
[C] Readily miscible with oxygen
[D] Less soluble in blood than nitrogen at high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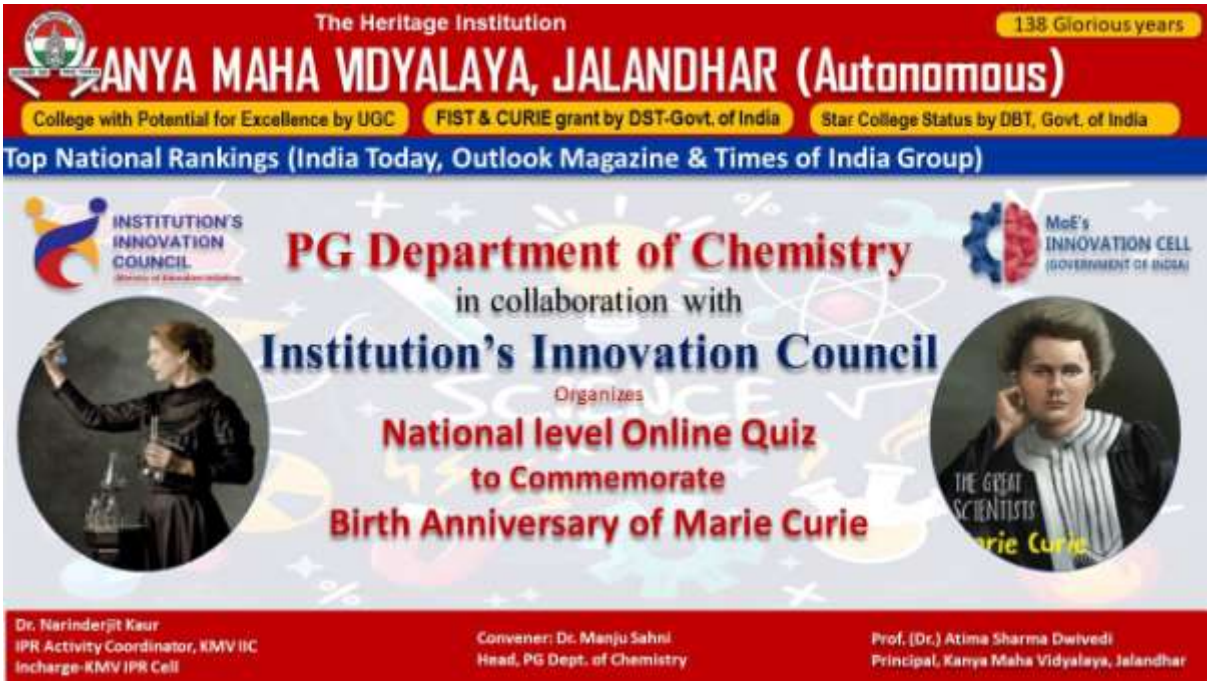
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Institution's Innovation Council
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National level Online Quiz
to Commemorate
Birth Anniversary of Marie Curie
THE GREAT SCIENTISTS
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IPR Activity Coordinator, KMV IIC
Incharge-KMV IPR Cell
Convener: Dr. Manju Sahni
Head, PG Dept. of Chemistry
Prof. (Dr.) Atima Sharma Dwivedi
Principal, Kanya Maha Vidyalaya, Jalandhar


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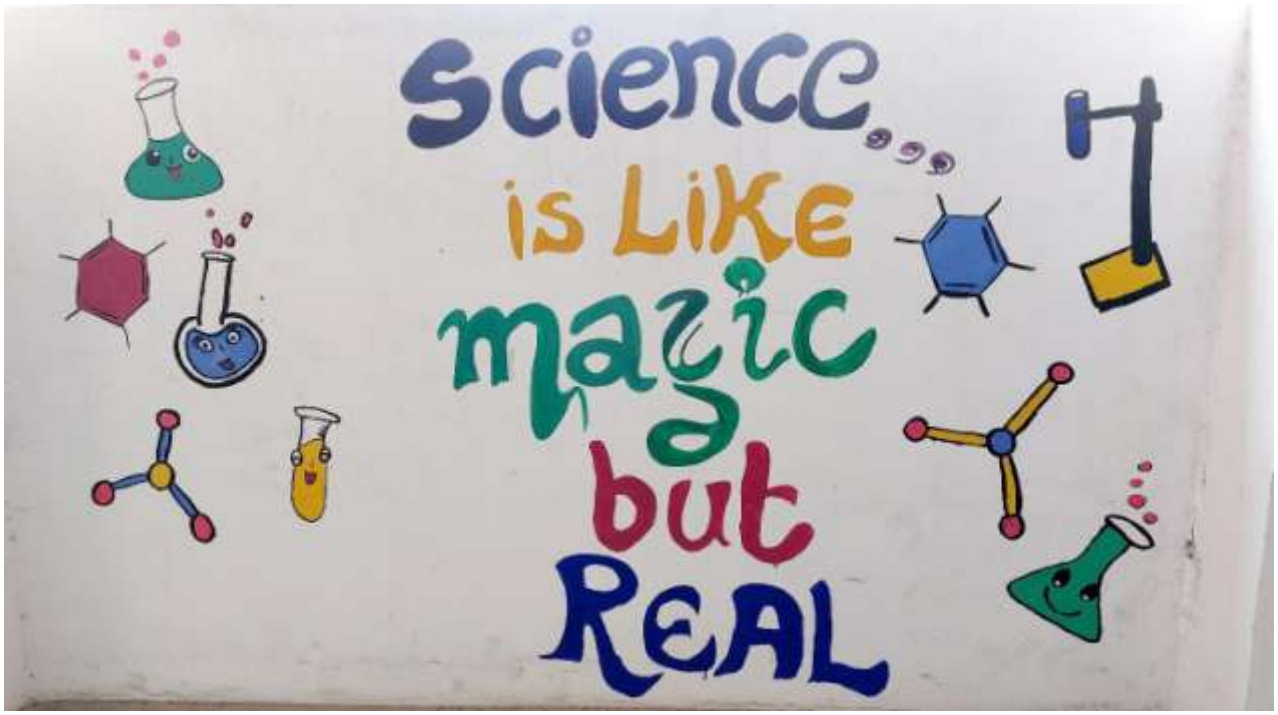
Sakshi
Kritika Thakur
Baban
Rupinder Kaur
Kannu
Komal Sharma
Aayushi


Science...
is Like
magic
but
REAL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CHEMISTR


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INDIAN ASSOCIATION OF PHYSICS TEACHERS
IAPT
National Science Day 2024
Celebrations on
Indigenous Technologies for Viksit Bharat
Organized by:
Department of Science
Kanya Maha Vidyalaya, Jalandhar
in collaboration with
National Anveshika Network of India


Innovative Courses

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on

February 29, 2024

Dr B.R. Ambedkar National Institute of Technology Jalandhar, Punjab.

One day Training

on

Characterization of Soft Materials.

Sponsored by

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- **Topics Covered**

20 March 2024

- Fabrication of liquid crystal cell.
- Study of micro textures through microscopy.
- Phases and phase transition temperatures.
- Optical effects in soft materials.

Registration Fee: NIL

Eligibility:

M.Sc. / PhD Students in Physics, Chemistry & Material Science.

For Registration:
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Benefits : Certificates, Lunch & Kit will be provided

Organized by

Department of Physics, NIT Jalandhar

Venue : Department of physics.

Contacts:

Dr. Praveen Malik.
Associate Professor, Physics Department
+91 9888382021

Mr. Harsh Sharma
Research Scholar, Physics Department.
+91 7078983436


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on
Characterization of
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KMV Department Of Chemistry

3m ·

"From Theory to Touch: PG students [M.Sc Chemistry Sem II & IV] from Kany... See more

FACULTY ENHANCEMENT

FACULTY PARTICIPATION IN INTERNATIONAL/NATIONALSEMINARS/WEBINAR

Name of the Teacher with department name	Dates of Seminar/ webinar	Name of Institution and place where seminar took place	Name of Seminar	Local/ State/National / International Level
Dr. Narinderjit Kaur Chemistry	30th Sept 2023	UpEducators, Google for Education	Webinar on Masterclass on ChatGPT and AI Tools	International
Dr. Narinderjit Kaur Chemistry	24th Feb 2024	Skill Nation	Webinar on ChatGPT& AI Hacks with MS Office	International
Dr. Narinderjit Kaur Chemistry	22nd October 2023	Guru Angad Dev Malaviya Mission Teacher Training Centre, SGTB Khalsa College, University of Delhi	National Webinar on Malaviya mission teacher training program	National
Dr. Narinderjit Kaur Chemistry	02 March 2024	Guru Angad Dev Malaviya Mission Teacher Training Centre, SGTB Khalsa College, University of Delhi	National Webinar on Is Air Pollution Responsible For Increasing Rate of Lung Cancer?	National
Dr. Narinderjit Kaur Chemistry	February 2024	NPTC Group of Colleges (UK)	International Online Webinar on Artificial Intelligence for Teaching	International

DETAILS OF RESEARCH PAPERS PRESENTED (NOT PUBLISHED) BY FACULTY AT CONFERENCES IN INDIA & ABROAD

Name of the Teacher with department name	Dates of Conference	Name of Institution and place where conference took place	Name of Conference	Local/ State/National / International
Tank SinderpalKabalsingh, Chemistry	**July 10th - 11th, 2023**	**Shri Mata Vaishno Devi University, Katra**	'Current Advances in Agriculture, Animal Husbandry and Allied Sciences' CAAAAS-2023'	**International Conference**
Tank SinderpalKabalsingh, Chemistry	17-19thJanuary, 2024.	Sant Baba Bhag Singh University, Jalandhar, Punjab	'Empowering Sustanability: ridging Science, Technology and Climate Resilience'	National Conference
Tank SinderpalKabalsingh, Chemistry	17-19thJanuary, 2024.	Sant Baba Bhag Singh University, Jalandhar, Punjab	'Empowering Sustanability: ridging Science, Technology and Climate Resilience'	National Conference
Dr. Narinderjit Kaur Chemistry	16 March 2024	PCM SD College for Women, Jalandhar	National Seminar on Sardar Vallabh Bhai Patel-Vision for the Future of India	National

FACULTY PARTICIPATION IN FACULTY DEVELOPMENT PROGRAMME FDP (EITHER IN YOUR COLLEGE OR OUTSIDE)

Name of the Teacher with department name	Dates of FDP	Name of Institution and place where FDP took place	Name of FDP	Local/ State/National / International Level
Ms. Tank SinderpalKabalSingh Chemistry	29-05-2023 to 02-06-2023	Chandigarh Engineering College, Jhanjeri, Mohali	Innovations in Water Treatment and Sustainable Infrastructure	National

			(FDP)	
Dr. Narinderjit Kaur Chemistry	December 16, 2023	Online NRCM Virtual Lab Nodal Centre (NVLNC), Narsimha Reddy Engineering College in collaboration with VALUE@Amrita, Amrita Vishwa Vidyapeetham, Kollam.	one day online faculty development programme on Virtual Lab - Value-Added Learning	National
Dr. Narinderjit Kaur Chemistry	28th March to 3rd April 2023	NPTC Group of Colleges, UK Awards	International FDP on Blended and Online Teaching-Learning	International

FACULTY PARTICIPATION IN ORIENTATION/REFRESHER/SHORT TERM COURSE (EITHER IN YOUR COLLEGE OR OUTSIDE)

Sr. No.	Name of the Teacher with department name	Dates of Course	Name of Institution and place where Course took place	Name of Course	Local/ State/National / International Level
	Tank SinderpalKabalsingh, Chemistry	15-08-2023 to 21-08-2023.	RajRishi Government Autonomous College, Rajasthan	"Environment Pollution: A Threat to Life in the Air"	International
	Tank SinderpalKabalsingh, Chemistry	05-06-2023 to 11-06-	Raj Rishi Government Autonomous	"Environment Pollution: A Threat to Life	National

		2023	College, Rajasthan	Below Water and World Environment Day Celebration Week"	
	Dr. Narinderjit Kaur Chemistry	12-09-2023 to 12-12-2023	Skills & Education Group, UK	SEG Level 3 Award in Education and Training	International 3 Month Course
	Dr. Narinderjit Kaur Chemistry	13-11-2023 to 24-11-2023	UGC-MMTTC)GAD-MMTTC), Sri Guru Tegh Bahadur Khalsa College, University of Delhi	NEP 2020 Orientation & Sensitization Programme	National/Orientation Programme

PAPERS published in International/National journals during the year:

Name of faculty and Department	**Number of co-authors**	**Title of paper**	**Name of journal**	**ISSN/ISBN no.**	**Volume /Page no/issue**	**Month, Year of Publication**	**Weather UGC/ SCI listed Journal**	**Impact factor if any**	**Link to journal**	**Link to the paper**
Tank SinderpalKabalsingh, Chemis	1	Adsorptive removal of malachite green	*Indian Journal of Che*	ISSN: 0975-0991	30	September 2023	Yes	0.76	https://www.scopus.com/sourceid/24098	https://doi.org/10.56042/ijct.v30i5.5193

try		using ferromagnetic Sterculia gum – graft-poly (n-isopropylacrylamide-*co*-acrylamide)/magnetite nanocomposite	*mical Technology*	(Online), ISSN: 0971-457X (Print)						

Paper published in proceedings of International/National conferences:

Name of faculty and Department	Number of co-authors	Title of paper	Title of the proceedings of the conference	Name of Conference	ISSN / ISBN	Dates	Name of Organizing Institution and Place
Tank SinderpalKabalsingh, Chemistry	1	Potential Applications of Fish Scale Waste as a Versatile Nanobiocomposite	Souvenir cum Conference Book	Current Advances in Agriculture, Animal Husbandry and Allied Sciences' CAAAAS-2023	**978-93-91995-11-9**	**July 10th - 11th, 2023**	**Shri Mata Vaishno Devi University, Katra**
Dr. Narinderjit Kaur Chemistry	-	Contributions of Sardar Vallabh Bhai Patel to education and	Sardar Vallabh Bhai Patel-Vision	National Seminar on Sardar Vallabh Bhai	978-819-708-6489	16 March 2024	**PCM SD College for Women,**

		Social Reforms	for the Future of India	Patel-Vision for the Future of India			**Jalandhar**

Books Chapters Published

Name of faculty and Department	Title of book	Title of the Chapter Published	ISSN/ ISBN no.	Pages (from-to)	Year and month of publication	Number of co-authors	Publish by national/international publishers	Address of publisher
Tank SinderpalKabalsingh, Chemistry	Environmental Sustainability with Green Technology	Sterculia, an Ecofriendly Exudate gum and its Biomedical, Industrial and Environmental Applications	978-81-961028-5-2	208-214	May 2023	1	International	IIP Iterative International Publishers, Karnataka
Tank SinderpalKabalsingh, Chemistry	Shadows of Modern Multidisciplinary Research	A study of pH dependent swelling behaviour of novel Sterculia gum – graft-poly(n-isopropylacrylamide-co-acrylamide) hydrogel	978-81-961028-5-2	312-315	2023	1	State	Twentyfirst Century Printing Press, Patiala
Tank SinderpalKabalsingh, Chemistry	Multidisciplinary Approach in Research Area	A Deep Insight into the Applications of Sterculia Gum in	978-81-966799-1-0	15-19	March 2024	1	National	The Hill Publications

		Drug Delivery						

Patent/ Copyright/Trade Mark Filed/Published

Title	Status Published/Filed	Number	Date of Award	Awarding Agency	Patent/ Copyright/Trade Mark
Rose-Marigold Eco-Printed Ayurvastra Cotton Half Sleeve Night wear dyed with Heena	Filed- May 2023	12143/2023-CO/A	-	Govt. of India	Copyright
Tie and Dye Ayurvastra Reusable Cotton Kitty Character Food Wrap	Filed- May 2023	12286/2023-CO/A	-	Govt. of India	Copyright
Upcycled Post Consumer Ayurvastra Cotton & Silk Shirt with Harda Natural Dyeing & Rust Printing	Filed- May 2023	16454/2022-CO/A	-	Govt. of India	Copyright
Upcycled Post Consumer Ayurvastra Cotton Silk Top with	Filed- May 2023	16447/2022-CO/A	-	Govt. of India	Copyright

Onion Peel Natural Dyeing & Rust Printing					
Upcycled Post Consumer Ayurvastra Velvet Silk Top with Harda Natural Dyeing & Rust Printing	Filed- May 2023	16399/2022-CO/A	-	Govt. of India	Copyright
Rose-Marigold Eco-Printed Ayurvastra Cotton Full Sleeve Night wear dyed with Heena Dr. Harpreet Kaur, Dr. Narinderjit Kaur	Granted	**A-145557/2023**	12/06/2023	Govt. of India	Copyright
Rose-Marigold Eco-Printed Ayurvastra Spaghetti Night wear dyed with Heena Dr. Harpreet Kaur, Dr. Narinderjit Kaur	Granted	A-146749/2023	14/07/2023	Govt. of India	Copyright

Tie and Dye Ayurvastra Reusable Cotton Envelop Food Wrap Dr. Harpreet Kaur, Dr. Narinderjit Kaur	Granted	A-146702/2023	14/07/2023	Govt. of India	Copyright

Details of Research Project through Government and non-government sources

Name of the Principal Investigator/ Co Investigator (if applicable)	**Name of the Funding agency**	**Type (Government/Non-Government)**	**Department of Principal Investigator/ Co Investigator**	**Year of Award**	**Funds provided (INR in lakhs)**	**Duration of the project**	**Title of Project**	**Status of project (Completed/In progress)**
Ms. Tanksinder palkabal Singh/ Barjinder Kaur, M.Sc Chemistry Semester I, Roll Number:224953 and Arshdeep Kaur, M.Sc Chemistry Semester I, Roll Number: 224954	KMV, Jalandhar	Non-Government	PG. Department of Chemistry	March, 2023	1,10,000/-	2 years	Sterculia gum based magnetic hydrogel matrix for adsorptive removal of dyes from aqueous solutions	ongoing
Dr. Narinderjit Kaur (PI),	KMV, Jalan	Non-Governmen t	PG. Department of	March, 2023	1,10,000/-	2 years	Green Synthesis of	ongoing

Ms. Aastha Palta (Co-PI), Ms. Mehak (Co-PI), Student Co-PIs Shruti Kalia, Simran Jaswal, Janvi Thakur, Anchal Saroch	dhar		Chemistry				Carbon Dots from Citrus Peels and its Application in Sensing	
Dr. Swati Awasthi/ Sakshi, M.Sc. Chemistry Sem 1,Roll Number: 224967 And Kritika M.Sc. Chemistry Sem 1, Roll Number: 224963	KMV, Jalandhar	Non-Government	PG. Department of Chemistry	March, 2023	1,10,000/-	2 Years	Synthesis, Characterization and Applications of imidazolium based ionic liquids	ongoing

Any other Research activity or achievement

Name of the Teacher with department name	**Dates**	**Name of Institution and place where activity took place**	**Title of talk/Name of Activity**	**Local/ State/National / International Level**

Dr. Narinderjit Kaur /PG Dept. Of Chemistry	28th April 2023	GAD TLC, SGTB Khalsa College, DU	One session on LMS-its Uses/ Online FDP on "BUSINESS DATA ANALYSIS USING R SOFTWARE"	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	9th May 2023	GAD TLC, SGTB Khalsa College, DU	One session on Login to MyeClass/ Online FDP on " Leveraging Teaching Learning Process A special focus on NEP and NAAC Accreditation	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	8June 2023	GAD TLC, SGTB Khalsa College, DU	One Session on How to create Quiz on LMS& 2 session on Hot Potatoes(in FDP on "Initiatives for Fostering Quality Higher Education in India in the 21st Century")	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	13 July 2023	GAD TLC, SGTB Khalsa College, DU	2 session on Hot Potatoes (in FDP on "Initiatives for Fostering Quality Higher Education in India in the 21st Century")	National
Dr. Narinderjit Kaur /PG Dept. Of	24th July 2023	GAD TLC, SGTB Khalsa College, DU	Session on LMS MOODLE in 15 Days Refresher course in Teaching	National

Chemistry			Pedagogy in Legal Studies, Commerce and Social Sciences.	
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	26th July 2023	GAD TLC, SGTB Khalsa College, DU	E Content Development & LMS	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	2nd August 2023	GAD TLC, SGTB Khalsa College, DU jointly with KR Mangalam Univ., Gurgaon	How to create Quiz on LMS	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	4th August 2023	Sh. Ishwar Singh Kanya Mahavidyalaya, Dhand, Dadwana, Haryana	E Content Development	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	21st August 2023	GAD TLC, SGTB Khalsa College, DU	Use of LMS-MyeClass	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	22nd August 2023	GAD TLC, SGTB Khalsa College, DU	How to login to LMS-MyeClass	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	27th August 2023	GAD TLC, SGTB Khalsa College, DU	Hot Potatoes	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	4th Sept 2023	Trinity College, Jalandhar	IPR-An Overview	State
Dr. Narinderjit Kaur /PG Dept. Of	5Th October 2023	GAD TLC, SGTB Khalsa College, DU	How to Login, Upload Assignments on MyeClass	National

Chemistry				
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	10th October 2023	GAD TLC, SGTB Khalsa College, DU	How to login to LMS-MyeClass	National
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	11th October 2023	KMV, Jalandhar	Session on Entrepreneurial Competencies	Local
Dr. Narinderjit Kaur /PG Dept. Of Chemistry	27th March 2024	GAD MMTTC,SGTB Khalsa College, DU	Hot Potato & Quiz on LMS	National

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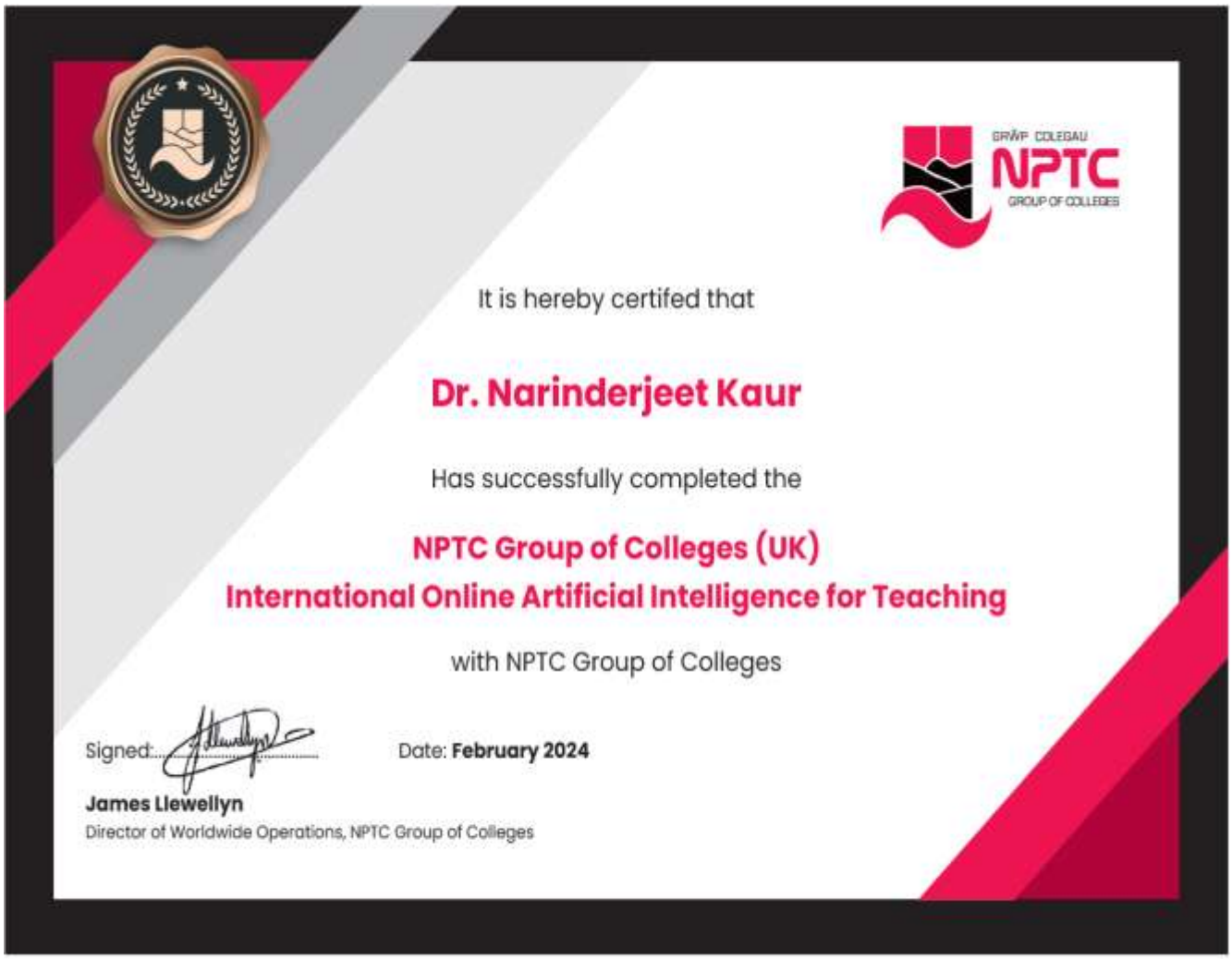

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NEP-NOV-B-2023-00539-030

PAPERS published in International/National journals during the year:(clear picture of full first page of publication in proofs)

Indian Journal of Chemical Technology
Vol. 30, September 2023, pp. 643-655
DOI: 10.56042/ijct.v30i5.5193

Adsorptive removal of malachite green using ferromagnetic sterculia gum – graft-poly(n-isopropylacrylamide-co-acrylamide)/magnetite nanocomposite

S K Tank[1,2] & N Sharma[1]*

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In present scenario, anthropogenic activities have degraded the quality of water bodies to an unbearable level. Discharge of untreated industrial and other effluents have made the water unconsumable. Present work is an attempt to fabricate new stimuli responsive adsorbent based on natural exudate gum sterculia, an indigenous natural gum for uptake of a cationic dye malachite green. Magnetic field responsive terculia gum–graft-poly(n-isopropylacrylamide-co-acrylamide) nanocomposite have been prepared and assessed it as adsorbents for enrichment of malachite green from aqueous solution. The nanocomposite is characterized by FTIR, TG-DTA, VSM and swelling studies. The VSM results have shown is superparamagnetic behaviour of nanocomposite with saturation magnetization of 1.5065 emu/g. The adsorption follows Temkin isotherm and results indicate maximum adsorption capacity of 19.977 (98.78%) malachite green. The desorption studies demonstrates excellent recovery ability of nanocomposite. The adsorption study confirms the prospective applications of polysaccharide based magnetic hydrogel for the fruitful and greener disposal of cationic dyes.

Keywords: Adsorption, Ferromagnetic, Magnetite, Malachite green, Recycling, Sterculia gum

Technological advancement has led to the growth of various industries like paper, cosmetics, printing, textile, plastic, pharmaceutical and food that make generous use of dyes. Effluents released from these industries are loaded with dyes that are highly soluble in water and toxic with lower degradation ability[1,2]. Additionally these dyes being synthetic, carcinogenic and mutagenic in nature have alarming threats to the human health as well as to the aquatic biota thereby disturbing the ecological balance[3,4]. Hence, the treatment of these precarious dyes is vital area of research.

Malachite green consists of a macrocyclic ring, an N-methylated diaminotriphenylmethane and employed for dying fabrics, paper and leather. It is also used as a biological stain and as an anti-fungal agent in aquaculture[5]. However the dye affect human immune system and has carcinogenic, mutagenic, teratogenic behaviour, chromosomal fracture ability, and respiratory toxicity[6,7].

From time to time different conventional methods namely ion exchange, biodegradation, coagulation-flocculation, adsorption, oxidation, photocatalysis and separation using membrane are reported for the degradation of dyes[8,9]. Amongst these methods, adsorption is extensively employed techniques on account of its high potency, inexpensiveness, facile handling, regeneration ability and environment friendly nature[10]. Classical adsorbents such as silica gel, activated charcoal, zeolites etc. show outstanding adsorption capacity for the enrichment of organic dyes. But high prices, lower efficiency and difficult recycling make it impossible to cater the increasing demand of water purification processes. Hence, to develop effective and viable adsorbents for controlling and removing various organic dyes from polluted water is the need of the hour. Polymeric hydrogels especially chemically functionalized hydrogels have revolutionized the dye enrichment strategies. Due to uncontrolled water pollution, and the rising demand to acquire better selectivity, stimuli responsiveness and efficient reusability, more efficient adsorbents are desirable.

In recent years, contemporary research trend focuses on the development of nanosized adsorbent having large surface area that plays pioneering role in facile adsorption. Magnetic nanocomposites using polymer such as alginate, dextrin, gum Arabic, gum xanthan, etc. has been synthesized and successfully employed for enrichment of dye and toxic metal ions from the aqueous solutions[11-13]. Iron oxide magnetic

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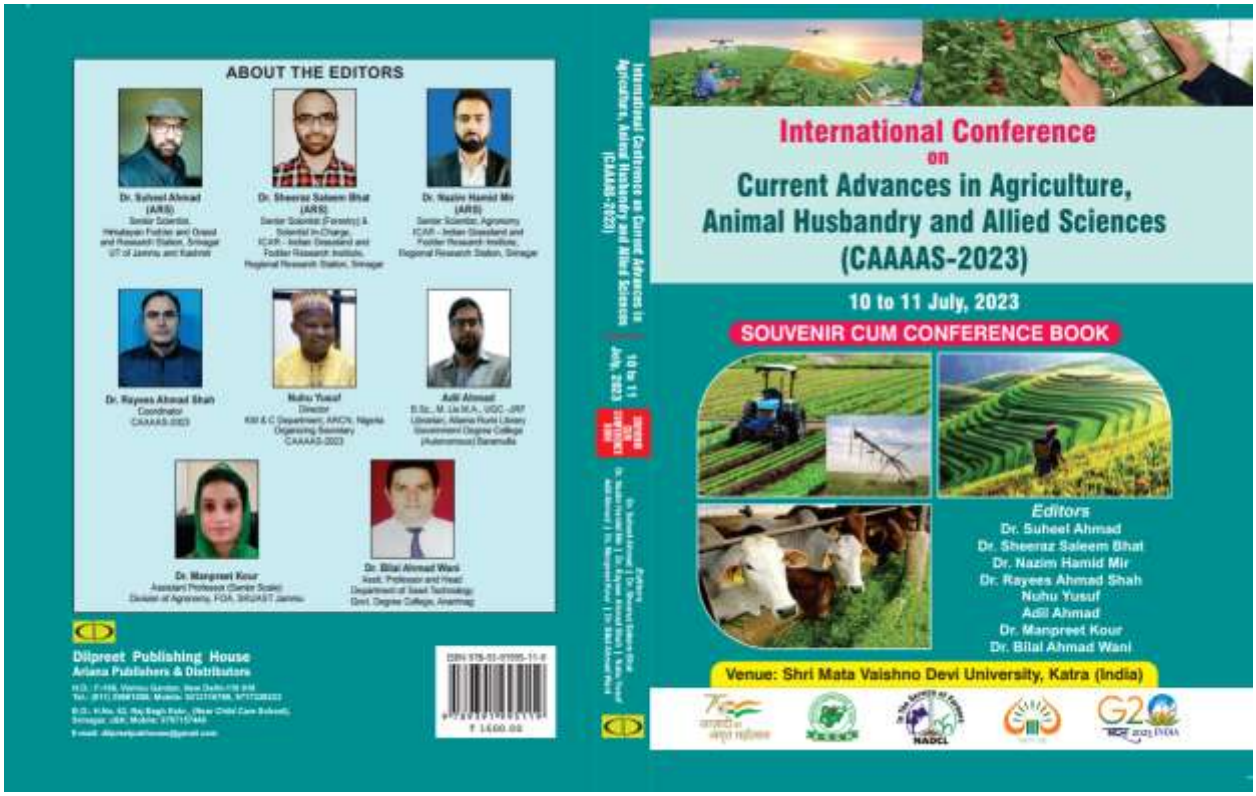
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10

Potential Applications of Fish Scale Waste as a Versatile Nanobiocomposite

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ABSTRACT

Fish scale waste from aquaculture sectors being inedible is considered as an environmental menace primarily due to its noncommercial value. But in fact, it is a cost effective sustainable and abundant biomaterial rich in collagen, hydroxyapatite, gelatin and lecithin. These distinct chemical components of fish scales can be tailored to form eco-friendly bio composites that can be further modified to form nanobiocomposite scaffolds that finds enormous applications. Such productive reuse of fish scale waste can drastically reduce the demand for landfill areas thereby subsequently reducing its processing cost. The major applications of fish scale based nanobiocomposites in industry caters to the removal of organic dyes and toxic metal ions from industrial effluents as biosorbents. These nanobiocomposite based biosorbents possess advantages like environment friendly nature, biodegradability, high selectivity, high efficiency, cost effectiveness and reusability making it a promising and versatile biomaterial. In the present mini review, an effort has been made to consolidate recent research on fabrication of fish scale based nanobiocomposites as potential biosorbents.

***Keywords**: Fish Scales, Nanobiocomposites, Biosorbents, Dye Removal, Toxic Metal ions, Biodegradable.*

Introduction

Pollution of rivers and other natural water bodies by industrial effluents is a serious threat all over the world. Hazardous compounds, including various heavy metals including lead, chromium, nickel, mercury, selenium, and arsenic, as well as other inorganic materials, are present in industrial and pharmaceutical wastes. Pharmaceutically active substances (PhACs), Endocrine disrupting substances (EDCs), insecticides, and personal care products (PPCPs) are some of these emerging contaminants (Shalla et al., 2018) (Briffa et al., 2020). Because they affect the fauna and flora, PhACs and heavy metals are not recommended to be present in the ecosystem. The removal of these harmful effluents is necessary and significant.

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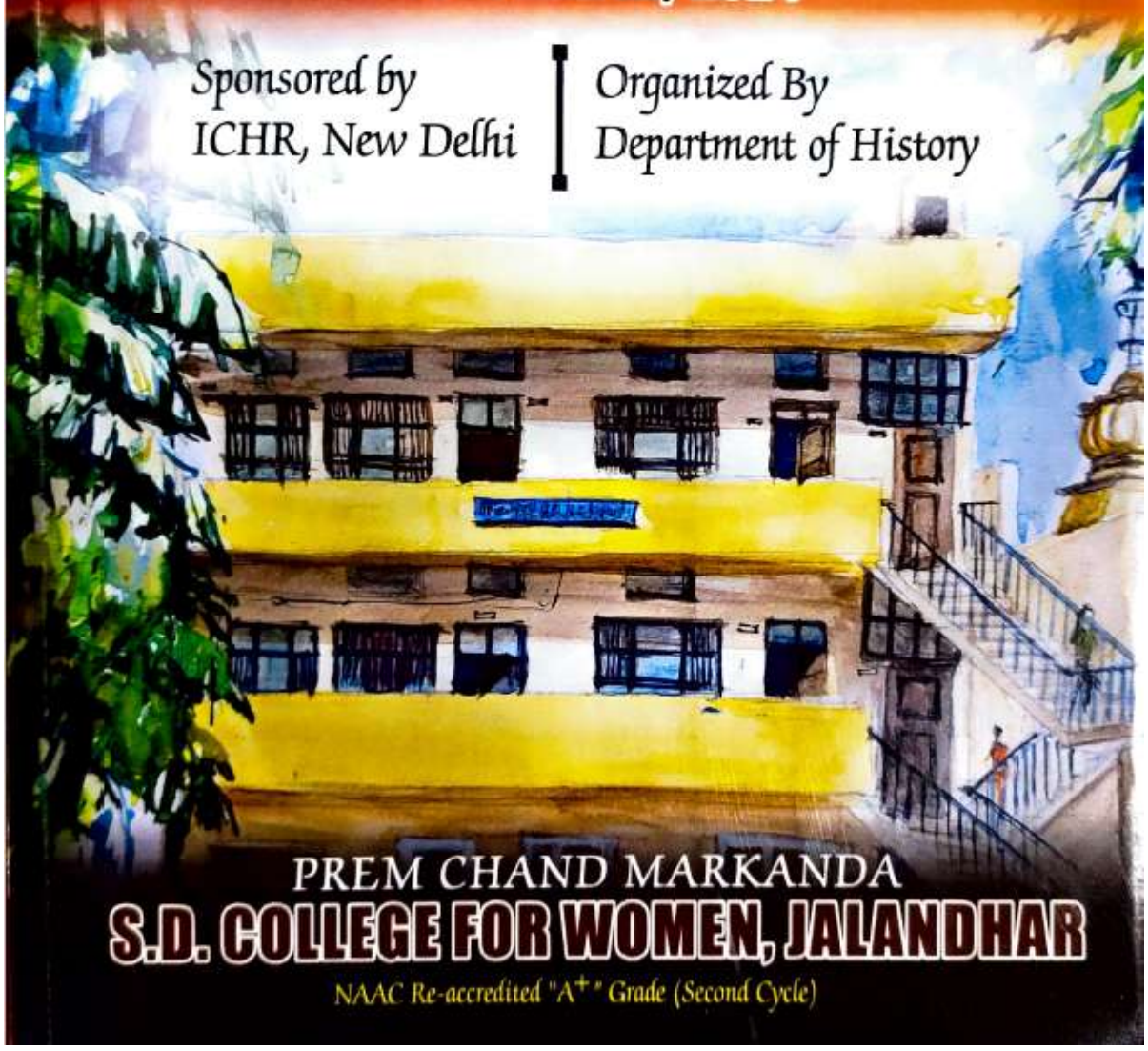

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ਪੰਜਾਬੀ ਸੈਕਸ਼ਨ

हिन्दी सैक्शन

27 CONTRIBUTIONSOF SARDAR VALLABH BHAI PATEL TO EDUCATION AND SOCIAL REFORMS

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Abstract:

Sardar Vallabhbhai Patel, the "Iron Man of India," made significant contributions not only to India's independence movement but also to the realms of education and social reforms. This article explores Patel's role in advocating for education, promoting social equality, and establishing institutions that would shape the future of India. From his emphasis on education as a tool for national development to his efforts in eradicating caste discrimination, Patel's legacy in education and social reforms remains a vital part of India's history.

Keywords: Sardar Vallabhbhai Patel, education, social reforms, India, nationalism, caste discrimination

Sardar Vallabhbhai Patel, one of the key architects of modern India, played a pivotal role in shaping the nation not only through his contributions to the independence movement but also through his efforts in education and social reforms. Known for his pragmatism and vision, Patel believed that a strong educational foundation was essential for the progress and unity of India. Additionally, he was a staunch advocate for social equality, working tirelessly to eradicate the deeply entrenched system of caste discrimination. This article delves into the significant contributions of Sardar Patel to education and social reforms, highlighting his enduring impact on the fabric of Indian society.

(A) Education: A Path to National Development

Patel firmly believed that education was the cornerstone of progress and development for any nation. He recognized that a well-educated populace would not only contribute to economic growth but also foster a sense of national unity. To this end, he advocated for the establishment of educational institutions across India, especially in rural areas where access to education was limited.

1. Advocacy for Education: Patel was a vocal proponent of education at all levels. He emphasized the need for quality schools and colleges that could impart

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A Study of pH Dependent Swelling Behavior of Novel Sterculia Gum – graft- Poly (n-isopropylacrylamide-co-acrylamide) Hydrogel

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Abstract

A robust method for fabrication of sterculia gum – graft- poly(n-isopropylacrylamide-co-acrylamide) hydrogel through graft copolymerization technique is presented. The successful grafting of sterculia gum using the crosslinker NNMBA gives well defined hydrogel network that is identified experimentally by swelling studies and by instrumental analysis using FTIRand SEM.The hydrogel demonstrated pH-sensitive swelling behavior with optimum swelling of 10.88 g/g at pH 9.2 and least of 7.91 g/g at pH 4.Newly synthesized gel matrix shows pH responsive behavior which further implies its broad potential for biomedical applications.

Keywords: *sterculia gum, swelling, pH responsive, graft copolymer, polysaccharide gum*

Introduction

Hydrogels have chemically responsive functional groups withdistinct three-dimensional permeable architectures, allowing them to absorb hazardous metal ions and wide ranging dyes from polluted water and discharge them when the aqueous solution conditions change. Sterculia gum is an anionic hydrocolloid. Sterculia gum is anionic, substituted and partially Sterculia gum is anionic, substituted and partially acetylated rhamnogalacturonogly can having D-galacturonic acid, D-glucuronic acid, D-galactose and L-rhamnose, aspartic and glutamic acids, as well as lower amounts of amino acids like glycine, leucine, proline, and threonine. Along with this small fraction of fatty acids such as stearic acid, linoleic acid, palmitic acid, eicosadienoic acid, and eicosatrienoic acid are also present[1,2]. Last two- decade witnessed extensive studies on modification and derivatization of exudate gums for different applications. Among diverse properties of hydrogels, swelling profile is one of the crucial one. Swelling behavior of a polymeric matrix is correlated with the chemical architecture of the gel and this is a deciding factor for the end use of hydrogels.

In the present study, we have functionalized sterculia gum by dual monomer n-isopropylacrylamide and acrylamide into interpenetrating network hydrogels through free radical graft copolymerization.The pH responsive behavior of the hydrogels is evaluated by swelling studies at pH 4.7 and 9.2.

Experimental Section

Materials

Sterculia gum was purchased from Sigma Aldrich (USA), N-isopropylacrylamide (NIPAM) from Alfa Aesar (China), acrylamide, tetramethylethylenediamine (TEMEDA) and N, N, Methylenebisacrylamide (N, N, MBA) from Molychem (India), Ammonium persulfate (APS), from Renkam (India), potassium dihydrogen phosphate, sodium hydroxide, potassium chloride was procured from S.D Fine Chem (India), hydrochloric acid from Merck (India). Buffer solutions

Chapter 18

Sterculia, an Ecofriendly Exudate gum and its Biomedical, Industrial and Environmental Applications

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Abstract

Environment deterioration is an appalling issue concerning human health, aquatic vegetation, and fauna. Various research groups are searching for viable solutions and powerful pollution reducing strategy inorder to maintain harmony in our Global ecosystem. In lieu with this, Sterculia gum is a versatile polysaccharide based gum with widespread applications. Sterculia gum is a therapeutically significant abundant, biodegradable, anionic, and hydrophilic exudate gum. It has ability to modulate its viscosity, rheology, and mechanical properties making it applicable as a food additive, as adhesive gel, and as wound-healing agent. The bulk laxative behavior of sterculia gum is immensely useful for curing chronic constipation, diarrhea, Irritable Bowel Syndrome, and diverticulitis. Further sterculia gum-based systems can be successfully fabricated through chemical modification to improve its functional characteristics, thus assisting it as metal ion/dye enrichment. Sterculia gum being derived from plant based source offers benefit of natural degradation. The present review outlines several applications of sterculia gum-based systems in biomedical, industrial and environment fields and also gives overview of advantages of sterculia gum over other natural gums.

Keywords: Sterculia Gum, Rhamnogalacturonoglycan, Wound Healing, Biomedical, Drug Delivery, Hydrogels, Dye Removal

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CONTENTS

A Deep Insight into the Applications of Sterculia Gum in Drug Delivery

Tank Sinderpal Kabalsingh[1], Sharma Nisha[2]
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Abstract
Sterculia urens Roxb is an indegeneous, versatile therapeutic, biodegradable and anionic polysaccharide exudate gum with plethora of applications in biomedical field like tissue engineering, drug delivery, wound dressing in native and modified forms. Its non-toxicity, excellent biocompatibility and unique properties like high viscosity, mucoadhesiveness, thixotropic and non-newtonian pesudoplastic behavior make it a suitable entity for pharmaceutical and medical applications. Sterculia gum has been successfully modified through chemical modification to develop three dimensional polymeric hydrogel with enhanced functional properties. This has attracted significant attention for their applications in drug delivery and revolutionized research in this field. Recent systems developed for drug delivery offers advantages like maximum therapeutic efficacy, specific drug delivery target and mininmum off- target accumulation in patient body. The present chapter summarises state –of –art reported applications of sterculia gum-based hydrogel in diverse drug delivery systems and also provides brief description of advantages of sterculia gum over other natural gums.

Keywords: Sterculia Gum, Rhamnogalacturonoglycan, Drug Delivery, Hydrogels, Thixotropic

Introduction

Gums secreted from plants are abundant and consist of structurally complex biological molecules. Polysaccharide gums are commonly obtained from tree trunks by adhesion or attack by organisms (Kuruwanshi et al., 2017). They exhibit unique properties such as hydrophilicity, biosafety, biodegradability, and durability, making them attractive biomaterials for scientific research. Natural gums are compatible with other agents, are recognized as safe and their properties can be modified by chemical reactions. Its non-toxicity and excellent biocompatibility make it a suitable entity for medical applications in tissue engineering, pharmaceautical industries as drug delivery, etc (Camponeschi et al., 2015; Censi et al., 2012; Lee et al., 2013). Recent systems developed for drug delivery offers advantages like maximum therapeutic efficacy, specific drug delivery target and minimum off- target accumulation in patient body.

Sterculia gum is derived from the resin secreted from the bark of the Sterculia urens tree of the Sterculiaceae family (Anderson et al, 1982; Leung, 1980). Structurally, it is a substituted rhamnogalacturonoglycan with a molecular weight of approximately 9.5 × 106 Daltons and contains partially acetylated D-glucuronic acid, D-galacturonic acid, D -galactose and L-rhamnose. The amino acids present are aspartic acid and glutamic acid, along with smaller proportions of glycine, leucine, proline, threonine, methionine, arginine, cysteine and histidine. The fatty acids present are stearic acid, linoleic acid, palmitic acid, eicosadienoic acid and eicosatrienoic acid (Edwards et al, 1998).

Sterculia gum is least soluble anionic hydrocolloid. The acetyl group in its structure leads it to swell up several times of the original volume to form a highly viscous solution. High viscosity is a prerequisite for any material for being an efficient thickener and stabilizer. Hence sterculia gum has been extensively employed as emulsifiers, stabilizers, and thickening agents in the pharmaceutical industry (Izydorczyk et al., 2005). Sterculia gum possesses emulsification index of 69 and its solutions are thixotropic displaying Newtonian flow and shear thinning behavior. These properties assist in formation of a spreadable paste or gels. Sterculia gum also possesses mucoadhesive behavior and good compatibility with other macromolecules like proteins, and carbohydrates.

Fig 1. Peculiar properties of Sterculia gum

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8.	आवेदन प्रकाशित है या अप्रकाशित Whether the work is published or unpublished	UNPUBLISHED
9.	प्रथम प्रकाशन का वर्ष और देश तथा प्रकाशक का नाम, पता और राष्ट्रीयता Year and country of first publication and name, address and nationality of the publisher	N.A.
10.	बाद के प्रकाशनों के वर्ष और देश, यदि कोई हो, और प्रकाशकों के नाम, पते और राष्ट्रीयताएं Years and countries of subsequent publications, if any, and names, addresses and nationalities of the publishers	N.A.
11.	आवेदन में कॉपीराइट सहित विभिन्न अधिकारों के मालिकों के नाम, पते और राष्ट्रीयताएं और असाइनमेंट और लाइसेंस के विवरण के साथ संबंधित के अधिकार की सीमा, यदि कोई हो। Names, addresses and nationalities of the owners of various rights comprising the copyright in the work and the extent of rights held by each, together with particulars of assignments and licences, if any	HARPREET KAUR , 312-B, SURYA ENCLAVE, NEAR ROSE PARK, JALANDHAR, PUNJAB-144009-144009 INDIAN RUCHIKA , KANYA MAHA VIDYALAYA, VIDYALAYA MARG, JALANDHAR--144004 INDIAN DR NARINDERJIT , KANYA MAHA VIDYALAYA, VIDYALAYA MARG, JALANDHAR--144004 INDIAN
12.	अन्य व्यक्तियों के नाम, पते और राष्ट्रीयताएं, यदि कोई हों, जो कॉपीराइट वाले अधिकारों को सौंपने या लाइसेंस देने के लिए अधिकृत हों Names, addresses and nationalities of other persons, if any, authorised to assign or licence of rights comprising the copyright	HARPREET KAUR , 312-B, SURYA ENCLAVE, NEAR ROSE PARK, JALANDHAR, PUNJAB-144009-144009 INDIAN RUCHIKA , KANYA MAHA VIDYALAYA, VIDYALAYA MARG, JALANDHAR--144004 INDIAN DR NARINDERJIT , KANYA MAHA VIDYALAYA, VIDYALAYA MARG, JALANDHAR--144004 INDIAN
13.	यदि कार्य एक 'कलात्मक कार्य' है तो कार्य वाले वाली वस्तु का नाम, पता और राष्ट्रीयता सहित मूल कार्य का स्थान। (एक वास्तुशिल्प कार्य के मामले में कार्य पूरा होने का वर्ष भी बताया जाना चाहिए) If the work is an 'Artistic work', the location of the original work, including name, address and nationality of the person in possession of the work. (In the case of an architectural work, the year of completion of the work should also be shown)	HARPREET KAUR , 312-B, SURYA ENCLAVE, NEAR ROSE PARK, JALANDHAR, PUNJAB-144009-144009 INDIAN
14.	यदि कार्य एक 'कलात्मक कार्य' है जो किसी भी वस्तुओं या सेवाओं के संबंध में उपयोग किए जाने के या उपयोग करने में सक्षम है तो आवेदन में कॉपीराइट अधिनियम, 1957 की धारा 45 उपधारा (i) खंड (ए) के प्रावधान के अनुसार व्यापार चिह्न रजिस्ट्रार से प्रमाणन शामिल होना चाहिए। If the work is an 'Artistic work' which is used or capable of being used in relation to any goods or services, the application should include a certification from the Registrar of Trade Marks in terms of the provision to Sub-Section (i) of Section 45 of the Copyright Act, 1957.	N.A.
15.	यदि कार्य एक 'कलात्मक कार्य' है जो क्या वह डिजाइन अधिनियम 2 अंतर्गत पंजीकृत है? यदि हां, तो विवरण दें If the work is an 'Artistic work', whether it is registered under t Designs Act 2000 if yes give details	N.A.

Registrar of Copyrights

3.2.1 Grants received from Government and Non-Governmental agencies for research projects, endowments, Chairs during the year

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Fax : 0181-2291741
E-mail : kmvjalandhar@yahoo.com
kmvoffice1886@gmail.com
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Phones : Principal Off. : 0181-2296605, 2296606
Fax : 0181-2291741
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KANYA MAHA VIDYALAYA (Autonomous)

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Ref. No. KMV/8492

Date 21/3/2023

Dr. Swati
P.G. Department of Chemistry
Kanya Maha Vidyalaya, Jalandhar

Subject: Seed Money Grant for Research Projects

With reference to the research board meeting held on 15.3.2023, I am pleased to inform you that your project entitled **"Synthesis, Characterization and Applications of imidazolium based ionic liquids"** has been approved for funding. Further, Ms Sakshi and Ms Kritika, M.Sc. Chemistry Sem II will be the co-investigators for this project. The allocation of grant is Rs. 1,10,000/- for the tenure of two years till March 31, 2025. The detail of the allocation is given below:

Item	Estimated Expenditure
i. Books and Journals:	Nil
ii. Equipment, if needed:	Nil
iii. Field Work and Travel :	10,000/-
iv. Chemicals and glassware:	75,000/-
v. Contingency (including special needs):	2,000/-
vi. Hiring Services:	23,000/-
Total:	**1,10,000/-**

The first installment of Rs.20,000/- will be released till 31.3.2023. Your progress will be monitored in the midterm meeting and continuation of the project will depend upon its outcome.

PRINCIPAL
Kanya Maha Vidyalaya
Jalandhar

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Ref. No. KMV/8495

Date 21/3/2023

Dr. Narinderjit Kaur
Ms. Aastha Palta
Ms. Mehak
P.G. Department of Chemistry
Kanya Maha Vidyalaya, Jalandhar

Subject: Seed Money Grant for Research Projects

With reference to the research board meeting held on 16.3.2023, I am pleased to inform you that your project entitled **"Green Synthesis of Carbon Dots from Citrus Peels and its Application in Sensing"** has been approved for funding. Further, Ms Shruti Kalia M.Sc. Chemistry Sem I, Ms Simran Jaswal M.Sc. Chemistry Sem I, Ms Janvi M.Sc Chemistry Sem I, Ms Anchal Saroch M.Sc. Chemistry Sem III will be the co-investigators for this project. The allocation of grant is Rs. 1,10,000/- for the tenure of two years till March 31, 2025. The detail of the allocation is given below:

Item Estimated Expenditure
i. Books and Journals: Nil
ii. Equipment, if needed : Nil
iii) Field Work and Travel: 10,000/-
iv) Chemicals and glassware: 80,000/-
v. Contingency (including special needs): 10,000/-
vi. Hiring Services:10,000/-
Total: 1,10,000/-

The first installment of Rs.20,000/- will be released till 31.3.2023. Your progress will be monitored in the midterm meeting and continuation of the project will depend upon its outcome.

PRINCIPAL
Kanya Maha Vidyalaya
Jalandhar

Awards/Resource Person/Invited Talk

3.1.3 Number of teachers who were awarded national / international fellowship(s) for advanced studies/research during the year:

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SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in One-Week Online National Faculty Development Program on **"Business Data Analysis Using R Software"** organized by Guru Angad Dev Teaching Learning Centre under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education and Department of Commerce, SGTB Khalsa College, University of Delhi, held from **28th April to 04th May 2023.**

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

www.tlckhalsa.in
Email: tlcworkshop@tlckhalsa.in

Guru Angad Dev
TEACHING LEARNING CENTRE

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SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in One-Week Online National Faculty Development Program on **"Leveraging Teaching-Learning Process: A special focus on NEP and NAAC Accreditation"** jointly organized by College of KCE Society's College of Engineering & Management, Jalgaon and Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education, held from **09th May to 15th May 2023.**

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

Guru Angad Dev
TEACHING LEARNING CENTRE

A Centre under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT), MHRD, Govt. of India.

SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in One Week Online National Faculty Development Programme on **"Initiatives for Fostering Quality Higher Education in India in the 21st Century"** jointly organized by K.R. Mangalam University, Sohna Road, Gurgaon, Haryana; Association of Pharmaceutical Teachers of India (APTI) and Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education, held from **01st August to 07th August 2023**.

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

Guru Angad Dev
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A Centre under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT), MHRD, Govt. of India.

SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in One-Month Online National **Faculty Inudction Programme** jointly organized by Janki Devi Memorial College, University of Delhi and Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education, held from **20th August to 19th September 2023**.

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

Guru Angad Dev
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SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in One Week Online National Faculty Development Program on **"Teaching-Learning Environment in Colleges & Universities: Trends & Required Innovations"** organized by Guru Angad Dev Teaching Learning Centre, a Centre under PMMMNMTT, Ministry of Education, Government of India in collaboration with Kamla PG College, Dholpur, Rajasthan, held from **25th July to 31st July 2023**.

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

Guru Angad Dev
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SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in Fifteen days National Online Refresher course on **"Teaching Pedagogy in Legal Studies, Commerce and Social Sciences"** jointly organized by Droit Penale Group, Prayagraj and Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education, held from **24th July to 07th August 2023**.

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

Guru Angad Dev
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SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October, 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in One-Week Online National Faculty Development Program on **"Quality in Higher Education and NEP-2020"** jointly organized by Tilak Education Society's and Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education, held from **07th June to 13th June 2023.**

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

Guru Angad Dev
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A Centre under Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT), MHRD, Govt. of India.

SRI GURU TEGH BAHADUR KHALSA COLLEGE
UNIVERSITY OF DELHI

06th October 2023

To whomsoever it may concern

This is to certify that **DR. NARINDERJIT KAUR, KANYA MAHA VIDYALAYA, JALANDHAR, PUNJAB** has contributed as **Resource Person** for **One-session** in One Week Online National Faculty Development Programme on **"Cancer Awareness"** jointly organized by Indian Cancer Society, Delhi; and Guru Angad Dev Teaching Learning Centre, SGTB Khalsa College, University of Delhi under the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) of Ministry of Education, held from **21st August to 28th August 2023**.

Prof. (Mrs.) Vimal Rarh
Project Head & Joint Director
GAD-TLC of Ministry of Education

93506-01845

ॐ Ph. 01746-250098 Mob. ~~092543-23450~~
e-mail : ciskmvdhand@gmail.com

CH. ISHWAR SINGH KANYA MAHAVIDYALAYA

DHAND-DADWANA (Kaithal)-136020 HARYANA

(Affiliated to Kurukshetra University Kurukshetra)

चौ० ईश्वर सिंह कन्या महाविद्यालय, ढाण्ड-डडवाना (कैथल) हरियाणा

*Ref. No. CISKMD/*2366/2023 *Date*05-12-2023

Dr. Narinderjit Kaur,
Kanya Mahaavidyalaya,
Jalandhar.

Sub: Appreciation Letter.

Dear Madam,

I would like to thank you for delivering on-line extension lecture as a Resource person on the topic "e-content Development" on 04/08/2023. It was an honour for our college to have you as our resource person who is expert in technical skills. I believe that the knowledge imparted by you will immensely help our faculty members in context e-content Development.

We look forward for your support in future as well.

With best regards.

5/12/2023

Dr.Sangeeta Sharma
Principal

(Office) 0181-2420793
(Principal) 0181 - 2420003

TRINITY COLLEGE, JALANDHAR

(Affiliated to Guru Nanak Dev University, Amritsar)
Church Nagar, Guru Gobind Singh Avenue,
P.O. Chogitty, Jalandhar-144009, Punjab, India.

NAAC Accredited and UGC Recognised under section 2(f) &12(B)

Ref. No. TCJ/2023-24/357 Dated 04/09/2023

To

Dr. Narinderjit Kaur,
Assistant Professor
Department Of Chemistry,
Kanya Maha Vidyalaya, Jalandhar.

Acknowledgement and Gratitude

Respected Madam,

It is a great privilege for us to have you as a Resource Person for Guest Lecture on the topic **"IPRs: An Overview" on 04/09/2023 (Monday) at 01:15PM.** We are grateful to you for sparing your valuable time for the benefit of our students.

We are sure that this interactive session will strengthen our bond and hope to work together in future for betterment of the society as well as the institution.

Regards

Principal 04/09/23

Principal
Trinity College
Jalandhar

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kmvoffice1886@gmail.com
Vidyalaya Marg,
JALANDHAR-144 004

Ref. No Kmv/3542

Date 22 NOV 2023

This is to certify that Dr. Narinderjit Kaur, Assistant Professor, PG Department of Chemistry, has delivered an expert talk on **"Entrepreneurial Competencies"** on 12.10.2023 under value-added programme "Innovation, Entrepreneurship and Creative Thinking" for final year students of undergraduate degree programmes. Her lecture was very informative and motivating. I wish her luck in her future endeavours.

PRINCIPAL
Kanya Maha Vidyalaya
Jalandhar

Annexure B

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

Master of Science (Chemistry)

Credit Based Continuous Evaluation Grading System (CBCEGS)

(Session: 2024-2025)

Semester III

Master of Science (Chemistry) Semester III										
Course Code	**Course Title**	**Course Type**	**Hours Per Week** **L-T-P**	**Credits** **L-T-P**	**Total Credits**	**Marks**				**Examination time** **(in Hours)**
						Total	**Th**	**P**	**CA**	
MCHL-3081	Inorganic Chemistry-II	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-3082	Organic Synthesis	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-3083	Surface and Polymer Chemistry	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-3084	Photochemistry and Pericyclic reactions	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHP-3085	Inorganic Chemistry Practical (Preparations)	C	0-0-6	0-0-3	3	75	-	60	15	3*2
MCHP-3086	Physical Chemistry Practical	C	0-0-6	0-0-3	3	75	-	60	15	3*2
Student can opt any one of the following Interdisciplinary compulsory courses. The ID course opted in Sem-I cannot be opted in Sem-III		IDE			4					
Total					**26**	**550**				

IDEC-3101*	Communication Skills		4-0-0			100	80	-	20	3
IDEM-3362*	Basics of Music (Vocal)		2-1-1			100	40	40	20	
IDEH-3313*	Human Rights and Constitutional Duties		4-0-0			100	80	-	20	
IDEI-3124*	Basics of Computer Applications		2-0-4			100	50	30	20	3+3
IDEW-3275*	Indian Heritage: Contribution to the world		4-0-0			100	80	-	20	3
(*Credits of these ID courses will not be added to SGPA)										

C- Compulsory Course

IDE- Inter Disciplinary Elective Course

IDC-Inter Disciplinary Compulsory Course

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3081
COURSE TITLE: Inorganic Chemistry-II

Course outcomes:

Students will be able to

CO1: study about the different oxygen carriers present in the body with their structure and stereochemistry

CO2: study the bioenergetics of various biological processes in living/non living organisms and role of bio-enzymes and their functioning.

CO3: learn biochemistry of iron and detailed mechanism of nitrogen fixation reactions

CO4: learn about the different enzymes participating in the chemical reactions inside the body and their functions and role of metal ions in medicines

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3081
COURSE TITLE: Inorganic Chemistry-II

Time: 3Hrs **Max. Marks: 100**

Credit (LTP): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (16 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Metal Ions in Biological Systems-Essential and trace elements, periodic survey of essential and trace elements, biological importance and relative abundance, Na^+/ K^+ ion pump.
Transport and Storage of Dioxygen- Oxygen carriers-Hb and Mb: Structure and mechanism of their function, co-operativity, inhibition and poisoning by ligands and metal ions, hemocyanins and hemerythrin, model complexes of iron, cobalt and copper.
.

UNIT-II

Bioenergetics and ATP Cycle- Process concept to phosphate hydrolysis, Nucleotide transfer-DNA polymerase, phosphate transfer pyruvate kinase, phosphoglucomutase, created kinase, ATPase **Photosynthesis and respiration** – chlorophyll : structure, function and its synthetic model.
Bioredox Agents and Mechanism- Enzymes and their functioning, Vitamin B_{12} coenzyme, its function and application in organic syntheses, intake of alcohol and its remedy.

UNIT-III

Biochemistry of Iron- Availability of iron, competition for iron, iron toxicity and nutrition.

Electron Transfer in Biology- Cytochromes-structure and function, CN^- and CO poisoning, Ferredoxin and rubredoxim. **Nitrogenase**- Biological N_2 fixation, molybdenum nitrogenase, spectroscopic and other evidence, other nitrogenases modelsystems.
Metal Storage, Transport- Ferritin, transferrin and siderophores.

UNIT-IV

Metalloenzymes- Zinc enzymes-carboxypeptidase and carbonic anhydrase, Copper enzymes-superoxide dismutase.
Calcium in Biology- Calcium in living cell, transport and regulation, molecular aspects of intramolecular processes,
Metals in Medicine- Metal deficiency and disease, toxic effects of antibiotics and related compounds, chelate therapy

Books Recommended:

1. Principles of Bioinorganic Chemistry, S. J. Lippard and Berg, University ScienceBooks.
2. Inorganic Biochemistry, Vol I and II. Ed. G. L. Eichhorn,Elsevier.
3. J.E. Huheey: Inorganic Chemistry III and IV Ed. Pearson Education Asia –(2002).
4. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, 5^{th}Edition.
5. Progress in Inorganic Chemistry, Vols 18 and 38 Ed. J. J. Lippard,Wiley
6. Bioinorganic Chemistry by D.Banergia

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3082
COURSE TITLE: Organic Synthesis

Course outcomes:

Students will be able to

CO1: understand general mechanistic consideration of organic rearrangements and to understand synthesis and reactions of macroring compounds and fused polynuclear hydrocarbons

CO2: study the synthesis and reactions of three, four, six, seven and large membered Heterocycles

CO3: know about the use of various reagents in organic synthesis and functional group transformations

CO4: understand the basic concepts of supramolecular chemistry

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3082
COURSE TITLE: Organic Synthesis

Time: 3 Hrs **Max. Marks: 100**

Credit (LTP): LTP: 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (16 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Rearrangements: General mechanistic considerations – nature of migration, migratory aptitude, memory effects. A detailed study of the following rearrangements: Pinacol-pinacolone, Wagner-Merwein, Demjanov, Benzil-Benzilic acid, Favorskii, Arndt-Eistert synthesis, Neber, Beckmann, Hofmann, Curtius, Schmidt, Baeyer-Villiger, Shapiroreaction.

Polynuclear Compounds and Macro-Ring Compounds
Introduction, comparative study of aromatic character of Linear and non-Linear-ortho-fused polynuclear hydrocarbons, ortho-and peri-fused polynuclear hydrocarbons.General method of preparation and reactions of indene, fluorene anthracene and phenanthrene.

UNIT-II

Heterocyclic Synthesis
Principles of heterocyclic synthesis involving cyclization reactions and cycloaddition reaction.

Small Ring Heterocycles
Synthesis of aziridines, oxiranes, thiiranes and their ring opening and rearrangement reactions.

Five-Membered Heterocycles with one Heteroatom
Synthesis of Furan, Pyrrole, Thiophene and their electrophilic, nucleophilic, metallation reactions.

Six-Membered Heterocycles with one Heteroatom
Pyridine synthesis (from dicarbonyl compounds, *Hantzsch Synthesis,* through *cycloaddition reactions),* reactions of pyridine (electrophilic, nucleophilic, metallation), synthesis of pyrylium salts, pyrones, benzopyrylium salts, benzopyrones (coumarins, chromones) and their electrophilic, nucleophilic and addition reactions.

Seven-and Large-Membered Heterocycles
Synthesis and reactions of azepines, oxepines, thiepines, thiazepines.

UNIT-III

Reagents in Organic Synthesis

Use of the following reagents in organic synthesis and functional group transformations; Complex metal hydrides, Gilman's reagent, lithium dimethylcuprate, lithium disopropylamide (LDA) dicyclohexylcarbodimide. 1,3-Dithiane (reactivity umpolung), trimethylsilyl iodide, tri-n-butyltinhybride, Woodward and prevost hydroxylation, osmium tetroxide, DDQ, selenium dioxide, phase transfer catalysts, crown ethers and Merrifield resin, Peterson's synthesis, Wilkinson's catalyst, Bakeryeast.

UNIT-IV

Supramolecular Chemistry

Definition and development of supramolecularchemistry, Classification of supramolecular Host-Guest compounds, Historical concepts such as receptors, coordination, lock and key analogy, Chelate and Macrocyclic effects, Preorganization and Complementarity, Thermodynamics and Kinetic selectivity, Overview of intermolecular forces such as Hydrogen bonding, Hydrophobic effects, Cation-π interactions, Ion-ion, Ion-dipole, Dipole-dipole interactions, π-π stacking, van der Waals forces, Synthesis and structure of supramolecular hosts for Recognition of cations: Crown ethers, Cryptands, Spherands, Siderophores;for Recognition of anions:Guanidinium- based receptors; for Recognition of neutral molecules: Cyclotriveratrylene (CTV).

Book Recommended:

1. Supramolecular Chemistry, Jonathan W. Steed, Jerry L. Atwood, John Wiley and Sons
2. Principles of Modern Hetrocyclic Chemistry by L.A. Paquette
3. Hetrocyclic Chemistry by J.A. Joule and K. Mills
4. Heterocyclic Chemistry by Gilrchirst

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3083
COURSE TITLE: Surface and Polymer Chemistry

Course outcomes:

Students will be able to

CO1: study concept of adsorption and activity of catalysis at surfaces, solve numerical on BET equation

CO2: understand the concept of micelle formation, learn about CMC and thermodynamics of micellization

CO3: learn about the type and classification of polymers

CO4: know about the structure, properties and utilization of polymers, study in detail about the glass transition temperature

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3083
COURSE TITLE: Surface and Polymer Chemistry

Time: 3 Hrs **Max. Marks: 100**

Credit (LTP): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (16 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Adsorption

Surface tension, capillary action, pressure difference across curved surface (Laplace equations), vapour pressure of droplets (Kelvin equation), Gibbs adsorption isotherm, estimation of surface area (BET equation), surface films on liquids (Electro-kinetic phenomena), and catalytic activity at surfaces.

UNIT-II

Micelles

Surface active agents, classification of surface active agents, micellization, hydrophobic interactions, critical micellar concentration (CMC), factors affecting CMC of surfactants, counter ion binding to micelles, thermodynamics of micellization – phase separation and mass action models, solubilization, micro emulsion, reverse micelles.

UNIT-III

Macromolecules

Polymer – definition, types of polymers, electrically conducting, fire resistant, liquids crystal polymers, kinetics of polymerization, thermodynamics ofpolymerization.
Molecular mass, number and mass average molecular mass, molecular mass determination (osmometry, viscometry, diffusion and light scattering methods), sedimentation, chain configuration of macromolecules, calculations of average dimensions of various chain structures. Importance of polymers, Basic concepts: monomers, repeat units, degree of polymerization. Linear, branched and network polymers. Classification of polymers. Polymerization: condensation, addition, radical chain-ionic and co-ordination and copolymerization. Polymerization conditions and polymer reactions.Polymerization in homogenous and heterogeneous systems. Number, weight and viscosity average weights.

UNIT IV

Structure and Properties:

Polymer structure and properties-crystalline melting point T_m-melting point of homogenous series, effect of chain flexibility and steric factors, entropy and heat of fusion. The glass transition temperature, T_g-Relationship between $T_m$and T_g, effects of molecular weight, diluents, chemical structure, chain topology, branching and chain linking. Property requirements and polymerutilization.

Books Recommended:

1. Physical Chemistry, P. W.Atkins.
2. Textbook of polymer science, F. W. Billmeyer Jr.Wiley.
3. Polymer science, V. R. Gowariker, N. V. Viswanathan and J. Sreedhar,Wiley-Eastern
4. Polymer Chemistry, Melcolm P. Stevens, Oxford University Press
5. Physical Chemistry of Polymers , A.Tager, Mir Publishers, Moscow

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3084
COURSE TITLE: Photochemistry and Pericyclic reactions

Course outcomes:

Students will be able to

CO1: classify the pericyclic reactions and explain them under thermal and photochemical conditions.

CO2: interpret the product of Pericyclic reactions (Cyclo addition, Electocyclic and sigmatropic Reactions)

CO3: know the basic concepts of photochemical reactions and determine their reaction mechanisms

CO4: apply the knowledge of photochemical reactions of Alkenes, carbonyl compounds, aromatic compounds and to study named photochemical reactions, photochemistry of smog, polymers and vision

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHL-3084
COURSE TITLE: Photochemistry and Pericyclic reactions

Time: 3 Hrs **Max. Marks: 100**

Credit (LTP): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (16 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-1

Pericyclic Reactions (A)
Molecular orbital symmetry, Frontier orbitals of ethylene, 1,3-butadiene, 1,3,5-hexatriene, allyl system, classification of pericyclic reactions FMO approach. Woodward-Hoffmann correlation diagrams method and Perturbation of molecular orbital (PMC) approach for he explanation of pericyclic reactions under thermal and photo-chemical conditions. Electrocyclic reactions – controtatory and disrotatory motions, 4n, 4n+2, allylsystems secondary effects. Cycloadditions – antrafacial and suprafacial additions, notation of cylcoadditions (4n) and (4n+2) systems with a greater emphasis on (2+2) and (4+2)

UNIT-II

Pericyclic Reactions (B)
cycloaddition-stereochemical effects and effects of substituents on the rates of cycloadditions, 1,3-dipolar cyclo-additions and cheleotropicreactions.Sigmatropic Rearrangements-suprafacial and antrafacial shifts [1,2]- sigmatropic shifts involving carbon moieties retention and invertion of configuration, (3,3) and (5,5)sigma-tropic rearrangements, detailed treatment of Claisen and Cope rearrangements, fluxional tautomerism, aza-cope rearrangements, introductions to Ene reactions, simple problems on pericyclic reactions. Elecrocyclic rearrangement of cyclobutenes and 1,3cyclohexadienes.

UNIT-III

Photochemistry
Interaction of electromagnetic radiation with matter, types of excitations, fate of excited molecule, quantum yield, transfer of excitation energy, actinometry.

Determination of Reaction Mechanism
Classification, rate constants and life times of reactive energy states –determination of rate constants of reactions. Effect of light intensity on the rate of photochemical reactions.Types of photochemical reactions – photodissociation, gas-phasephotolysis.

UNIT-IV

Photochemistry of Alkenes

Intramolecular reactions of the olefinic bond – geometrical isomerism, cyclisation reactions, rearrangement of 1,4- and 1, -dinenes.

Photochemistry of Carbonyl Compounds

Intramolecular reactions of carbonyl compounds – saturated, cyclic and acyclic, β, γ- unsaturated and α,β-unsaturated compounds, Cyclohexadienones. Intermolecular cycloaddition reactions – dimerisations and oxetane formation.

Photochemistry of Aromatic Compounds

Isomerisations, additions and substitutions.

Miscellaneous Photochemical Reactions

Photo-Fries reactions of anilides.Photo-Fries rearrangement.Barton reaction.Singlet molecular oxygen reactions.Photochemical formation of smog.Photodegradation of polymers.Photochemistry of vision.

Books Recommended:

1. Organic Photochemistry – Chapman andDepuy.
2. Organic Photochemistry – W.H.Horsepool.
3. Photochemistry of Excited States –J.D.Goyle.
4. Pericyclic Reactions: A Mechanistic study by S.M. Mukherji
5. The conservation of orbital Symmetry by R. B. Woodward and R. Hoffman
6. Fundamentals of Photochemistry by K.K.Rohtagi Mukherji

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHP-3085
COURSE TITLE: Inorganic Chemistry Practical (Preparations)

Course outcomes:

Students will be able to

CO1:plan and conduct experiments for synthesizing and analysing the inorganic compounds

CO2:do measurements of magnetic moments of synthesized complexes.

CO3:estimate metal ions in the synthesized complex through various analytical techniques

CO4:interpret and characterise the metal complexes through various spectrpscopic and analytical techniques

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHP-3085
COURSE TITLE: Inorganic Chemistry Practical (Preparations)

Time: 6 Hrs **Max. Marks: 75**
Credit (LTP): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

1. Preparation of $Co(acac)_3$, its characterization using NMR, IR, UV-Vis and analysis of Cobalt. (ref. J. Chem. Edu., 1980, 57, 7,525)
2. Preparation of $Co(acac\text{-}NO_2)_3$, its characterization using NMR, IR, UV-Vis andanalysis of Cobalt. (ref. J. Chem. Edu., 1980, 57, 7,525)
3. Preparation of $[Fe(H_2O)_6][Fe(N\text{-salicyldeneglycinato})_2]_2.3H_2O$, its characterization using IR, UV-Vis, magnetic susceptibility and analysis of Iron.(ref. InorganicaChimicaActa, 1977, 23,35).
4. Preparation of $[Ni(NH_3)_6]Cl_2$ its characterization using IR, UV-Vis, magnetic susceptibility and analysis of Nickel and NH_3. (ref. Marr and Rockett,1972).
5. Preparation of $[Ni(ethylenediamine)_3]Cl_2$ its characterization using IR, UV-Vis, magnetic susceptibility and analysis of Nickel. (ref. Marr and Rockett, 1972, page270).
6. Preparation of $[Fe(NO)(S_2CN(Et)_2)_2]$ its characterization using IR, UV-Vis, magnetic susceptibility and analysis of Fe(II). (ref. Marr and Rockett, 1972, page 262, J. Chem. Soc. 1962, 84,3404).
7. Preparation of octahedral and tetrahedral complexes of dichlorodipyridylcobalt(II), differentiate them using IR, UV and magnetic properties. Estimate Co(II) from one of them. (ref. Marr and Rockett, 1972, page 375, Inorganic Chemistry, 1966, 5,615).
8. Preparation of $VO(acac)_2$ and its piperidine complex, characterize using IR, UV and magnetic moment. Estimate for V(IV). (ref. Marr and Rockett, 1972,243).
9. Preparation of diaquotetraacetataocopper(II), magnetic susceptibility IR and UV-Vis, analysis ofCopper(II).
10. Preparation of cis- and trans- potassium dioxalatodiaquochromate(III). Interpretation of IR, UV and magnetic properties. Estimation of Chromium. (ref. Marr and Rockett, 1972, page386).
11. Preparation of $HgCo(NCS)_4$, its IR and measure its magnetic moment. (ref. Marr andRockett, 1972, page365).

12. Preparation of sodium tetrathionate, interpretation of its IR and analysis using potassium iodate. (ref. Marr and Rockett, 1972, page214).
13. Preparation of Potassium dithionate, interpretation of its IR and analysis using potassium iodate. (ref. Marr and Rockett, 1972, page214).
14. Preparation of bis(acetylacetonato)copper(II), UV-Vis, and IR, magnetic studies, Demonstration of Jahn Teller effect by solution spectral studies. (ref. Bull. Chem. Soc. Japan, 1965, 29,852).
15. Preparation of salicylamide complexes of Copper(II). IR, UV, magnetic data and analysis of Cu(II). (ref. Indian J. of Chem., 1977, 15A, No. 5, 459; ibid, 1971, 9,1396).
16. To prepare a macrocyclic ligand 5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclo tetradeca-4,11-dienedi(hydrogeniodide) and its complex with Ni(II). Study IR, NMR and UV-Vis of ligand and complex and magnetic properties of complex. To analyze for Ni and I. (J. Chem. Edu. 1977, 79,581).
17. Preparation and resolution of tris (ethylenediamine) cobalt (III). UV-Vis, NMR, IR, optical rotation of the resolved complexes. ((ref. Marr and Rockett, 1972, page386).

Books Recommended:

1. B.N. Figgis, Introduction to Ligand Field, WileyEastern.
2. A.B.P. Lever, Inorganic Electronic Spectroscopy,Elsevier.
3. A.Earnshaw, Introduction to Magnetochemistry, AcademicPress.
4. J.E. Huheey, Inorganic Chemistry Principles of Structure and Reactivity, Harper Interscience.
5. R.S. Drago, Physical Medhod in Chemistry, W.B.SaundersCompany.
6. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, WileyInterscience.
7. F.A. Cotton, Chemical Application of Group Theory, WileyEaster

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHP-3086
COURSE TITLE: Physical Chemistry Practical

Course outcomes

Students will be able to

CO1: apply the principle and mechanism of Conductometric and potentiometric titrations

CO2: determine the partial molar volumeof compounds using Dilatometer

CO3: determine specific and molar refractivity using Abbes refractometer

CO4: study complex formation and the kinetics of hydrolysis Spectrophotometrically

Master of Science (Chemistry)
(Semester-III)
Session: 2024-25
COURSE CODE: MCHP-3086
COURSE TITLE: Physical Chemistry Practical

Time: 6 hrs. **Max. Marks: 75**
Credit (LTP): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

1. To determine the partial molar volume of
   (a) Glycine (b) Urea using dilatometer
2. To determine the partial molar volume of
   (a) methanol (b) n-propanol using dilatometer
3. To determine the surface tension (double capillary) of mixture of solid and water by deferential method and hence find out parachor of the mixture.
4. To determine the specific and molar refractivity of n-propanol, butanol, hexane and carbon tetrachloride and calculate refraction equivalents of C, H andCl.
5. To determine the molar refractivity of water, DMF, Dioxane and mixtures of water-DMF, water-Dioxane and verify the refractivity rule. Predict about the interactions between components of mixture by plotting graph between refractive index and mole fraction.
6. To determine the equivalent conductance of weak electrolyte (acetic acid) at infinite dilution using Kohlrausch law.
7. Determine equivalent conductance of strong electrolyte at several concentrations and hence verify Onsagerequation.
8. Determine equivalent conductance of weak electrolyte, say acetic acid at different concentrations and hence test validity of Ostwald's dilution law. Also determine dissociation constant of the electrolyte.
9. To determine dissociation constant of a dibasic acid potentiometrically.
10. To study complex formation between Fe (III) and salicylic acid and find out the formula of the complex spectrophotometrically.
11. To determine the formula of the complex ion formed between Fe (III) and thiocyanate ion by Job's method.
12. To study the kinetics of hydrolysis of crystal violetspectrophotometrically.
13. To determine the pH of various mixtures of sodium acetate and acetic acid in aqueous solution and hence determine the dissociation constant of theacid.
14. Titrate potentiometrically Zn(II) by $K_4Fe(CN)_6$ and verify the composition of the complex $K_2Zn_3[Fe(CN)_6]_2$
15. Determination of nitrite in water spectrophotometrically.
16. Determination of molecular weight of polymers by Viscometry.
17. Determine the molar refraction of a solid substance by dissolving it in a solvent and its refractive index.

Books Recommended:

1. Yadav, J. B (2005): *Advanced Practical Physical Chemistry*, 22nd edition, Goel publishing House, Krishna Prakashan Media Ltd.

2. Venkatesan, V., Veeraswamy, R. and Kulandaivelu, A.R (1997): *Basic Principles of Practical Chemistry*", 2nd edition, Sultan Chand and Sons Publication, New Delhi.

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

Master of Science (Chemistry)
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)
Semester IV

Master of Science (Chemistry) Semester IV										
Course Code	**Course Title**	**Course Type**	**Hours Per Week** **L-T-P**	**Credits** **L-T-P**	**Total Credits**	**Marks**				**Examination time** **(in Hours)**
						Total	**Th**	**P**	**CA**	
MCHL-4081	Advanced Inorganic Chemistry	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-4082	Chemistry of Natural Products	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-4083	Electrochemistry and Chemical Dynamics	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHP-4084	Advanced Practical-Organic Synthesis	C	0-0-6	0-0-3	3	75	-	60	15	3*2
MCHP-4085	Advanced Practical-Inorganic Synthesis	C	0-0-6	0-0-3	3	75	-	60	15	3*2
MCHP-4086	Advanced Practical-Physical Chemistry	C	0-0-6	0-0-3	3	75	-	60	15	3*2
Total					**21**	**525**				

C- Compulsory Course

IDE- Inter Disciplinary Elective Course

IDC-Inter Disciplinary Compulsory Course

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHL-4081
COURSE TITLE: Advanced Inorganic Chemistry

Course outcome:

Students will be able to

CO1:understand Photo substitution reactions,photoredox reactions, photolysis of water

CO2:understand oxidative addition and reductive elimination, migration (Insertion) reaction and cyclometallation reactions,

CO3:characterise the compound by synthetic methods and know the chemical behaviour and synthetic applications of hydride compounds

CO4:understand hydroformylation, Carbonylation Reaction, decarbonylation reactions, hydrocyanation Polymerization, Oligomerisation and metathesis reactions

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHL-4081
COURSE TITLE: Advanced Inorganic Chemistry

Time: 3 Hrs **Max. Marks: 100**

Credit (LTP): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (16 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Photo Inorganic Chemistry:

Basics of photochemistry- Absorption, excitation, photochemical laws, quantum yield, electronically excited state, energy diddipation by radiative and non-radiative processes, absorption spectra, Franck-Condon principle, photochemical stages-primary and secondary processes, Kashia's rule, Thexi state, Photo substitution reactions, Adamson's rules, Photo substitution reactions of Cr(III)-Polypyridyls, Rh(III) Ammine Complexes, Ru-Polypyridyl complexes, Ligand photo reactions, photoredox reactions, comparison of Fe(II) and Ru(II) complexes, Photo synthesis in plants and Bacterio chlorophyll photosynthesis.

UNIT-II

Oxidative-Addition and Migration (Insertion Reactions):

Introduction: Acid base behaviour of metal atoms in complexes, Protonation and Lewis Base behaviour, acceptor properties of Lewis acidity of complexes, oxidative addition and reductive elimination, addition of specific molecules, Hydrogen addition, HX additions, Organic halides addition of some other molecules productive elimination, migration (Insertion) reaction promotion of alkyl migration, insertion of CO into M-H bonds, other aspects of CO insertion reactions, transfer of other molecules, CO_2, SO_2 , NO_2 , RCM, Insertion of alkenes and C-C unsaturated compounds, Cleavage of C-H bonds; alkane activation, Cyclometallation reactions. Reactions of free hydrocarbons.

UNIT-III

Transition Metal Compounds with Bonds to Hydrogen

Characteristics of hydride complexes, synthetic methods, chemical behaviour of hydride compounds, mononuclear polyhydrides, homolepticpolyhydride anions; carbonyl hydrides and onion. Molecular hydrogen compounds; metal hydrogen interaction with C-H bonds; MH interactions; complexes of boron hydride and aluminohydrides, synthetic applications of metal hydrides.

UNIT-IV

Transition Metal Complexes in Catalysis:

Hydroformylation of unsaturated compounds, Reductive carbonylation of alcohols and other compounds; Carbonylation Reaction: Methanol and methyl acetate, Adipic ester. Synthesis and other carbonylation reactions, decarbonylation reactions. Cluster compounds in catalysis, supported homogeneous and phase transfer catalysis, Acrylonitrile synthesis, oxygen transfer from peroxo- and oxo- species, oxygen transfer from NO_2groups.

Books Recommended:

1. Concepts of Inorganic Photochemistry, A. W. Adamson and P. D. Fleischauer,Wiley.
2. W.W. Porterfield, Inorganic Chemistry: A Unified Approach.
3. F.A. Cotton and G. Willkinson, Advanced Inorganic Chemistry, 5^{th}ed, John Wiley and Sons, NewYork.
4. C.ElschenbroichandA.Salzer,Organometalics:AConciseIntroduction,2^{nd}Ed.,VCH 1992.

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHL-4082
COURSE TITLE: Chemistry of Natural Products

Course outcome:

Students will be able to

CO1: study the biosynthetic pathways of natural products, understand the isoprene rule and its role in terpenoids

CO2: classify and understand the synthesis and structure of steroids and alkaloids

CO3: understand the chemistry of Haemin, chlorophyll, prostaglandins and antibiotics

CO4: classify and elucidate the structure of carbohydrates like starch and cellulose, determine the structure conformation and properties of proteins, nucleic acids, DNA and RNA

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHL-4082
COURSE TITLE: Chemistry of Natural Products

Time: 3 Hrs **Max. Marks: 100**

Credit (LTP): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator

Instructions for the Paper Setters:

Eight questions of equal marks (16 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-1

Studies on Biosynthetic Pathways of Natural Products
The acetate hypothesis, poly-ketoacids, their aldol type cyclisations and meta orientations of hydroxyl groups in naturally occurring phenols. b) Isoprene rule, mechanism of formation of mevalonic acid from acctyl coenzyme, Biogenetic isoprene rule. Geranyl, Geranyl pyrophosphates and its conversion into thujene. Farnesyl pyrophosphate.

UNIT-II

Terpenoids
General classification, General Methods of structure determination, Chemistry of Camphor, Abietic acid, Santonin biosynthetic studies on tri and tetra terpenoids.
Steroids
General biosynthetic studies on steroids, chemistry of Cholesterol, progesterone, oestrone, transformations in steroid molecules.
Alkaloids
Classification, chemistry of nicotine and morphine.

UNIT-III

Haemin and Chlorophyll
Structure and synthesis of Porphyrins.Chemistry of Haemin and chlorophyll.
Antibiotics
Introduction, types of antibiotics, synthesis and mechanism of action of pencillins.
Prostaglandins
General study, nomenclature, structure of PGE and synthesis of PGE1, PGE2, PGF2x

UNIT-IV

Carbohydrates
Deoxy sugars, sugars, methyl others and acid derivatives of sugars. General methods of structure and ring size determination, structure of maltose, lactose, sucrose, starch and cellulose.

Peptides and Proteins
Sequence determination insulin and oxytocin, Proteins: structure conformation and properties. Enzymes, Kinetics, inhibition mechanism.

Books Recommended

1. Primary Metabolism: A Mechanistic Approach by J.Staunton, Oxford University Press 1978.
2. Secondary Metabolism by J. Mann Oxford University Press. Oxford, 1980.
3. Natural Product Chemistry- A Mechanistic, Biosynthetic and Ecological Approach by Kurt B. G. Torssell, Swadish Pharmaceutical Society, 1997.
4. Fundamentals of BioChemistry by D. Voet, J.G. Voet and C.W.Pratt, John Wiley and Sons Inc., New York, 1999.
5. Principles of Biochemistry by A.L. Lehninger, CBS Publishers, New Delhi

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHL-4083
COURSE TITLE: Electrochemistry and Chemical Dynamics

Course outcomes:

Students will be able to

CO1: Understand the electrochemistry of solutions, method of determination of electrified interfaces, semiconductor electrolyte solution interface, know theory, monitoring and prevention of corrosion

CO2: understand collision theory of reaction rates, Arrhenius theory and activated complex theory, Lindemann-Hinshelwood theory

CO3: understand various Photochemical reactions, Homogeneous catalysis and kinetics of enzyme reactions, general features and methods of studying fast reactions

CO4: interpret polarogram and applications of Voltammetry and Polarography.

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHL-4083
COURSE TITLE: Electrochemistry and Chemical Dynamics

Time: 3 Hrs **Max. Marks: 100**

Credit (LTP): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (16 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Electrochemistry Electrochemistry of solutions, Debye-Huckel-Onsager treatment and its extension, ion-solvent interactions, Debye-Huckel-Bjerrum mode, Thermodynamics of electrified interface equation, Derivation of electro-capillarity, Lipmann equation(surface ecess), method of determination, structure of electrified interfaces, Guoy-Chpmann, Stern models, over potential, exchange current density, derivation of Butler-Volmer equation, Tafel plot.

Semiconductor interface theory of double layer at semiconductor electrolyte solution interface, structure of double layer interfaces, effect of light at semiconductor solution interface.

Introduction to corrosion, homogeneous theory, forms of corrosion, corrosion monitoring and prevention

UNIT-II

Chemical Dynamics (A)

Methods of determining rate laws, collision theory of reaction rates, steric factor, activated complex theory, Arrhenius theory and activated complex theory, ionic reactions, kinetic salt effects,, treatment of unimolecular reactions, Lindemann-Hinshelwood theory. Dynamic Chain (hydrogen bromine reaction, pyrolysis of acetaldehyde, decomposition of ethane)

UNIT-III

Chemical Dynamics (B)

Photochemical reactions between hydrogen-bromine and hydrogen-chlorine, oscillatory reactions (Belousov-Zhabotinsky reactions), Homogeneous catalysis and kinetics of enzyme reactions, general features of fast reactions, study of fast reactions by flow method, relaxation method, flash photolysis.

UNIT-IV

Voltammetry and Polarography

Polarography, polarographic cells, polarogram, interpretation of polarographic waves, equation for the polarographic waves, effect of complex formation on polarographic wave, polarograms for irreversible reactions, dropping mercury electrode, current variations during life time of a drop, merits and demerits of dme, polarographic diffusion currents, Ilkovic equation, capillary characteristics, temperature, polarograms for mixture of reactants, anodic and cathodic waves, factors affecting polarographic currents, applications of polarography, treatment of data, organic and inorganic polarographic analysis, voltammetry at solid electrodes, cyclic voltammetry and interpretation of data, pilot-ion and standard addition method for quantitative analysis

Books Recommended:

1. Chemical Kinetics, K. J. Laddler,McGraw-Hill
2. Modern Electrochemistry Vol.1,2,3, J. Bochris and A.K.N.Reddy
3. Fundamentals of electrochemistry; P.Monk
4. Principles of Instrumental Analysis; Skoog, West; SaundresPublications

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHP-4084
COURSE TITLE: Advanced Practical- Organic Synthesis

Course outcome:

Students will be able to

CO1: plan and implement advance organic synthesis and reactions

CO2: characterize organic molecules by physical and spectroscopic means, including M.P, B.P, and IR

CO3: predict the outcome and mechanism of some simple organic reactions, using a basic understanding of the relative reactivity of functional groups

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHP-4084
COURSE TITLE: Advanced Practical- Organic Synthesis

Time: 6 hrs. **Max. Marks: 75**
Credit (LTP): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office,Kanya Maha Vidyalaya,Jalandhar.

1. Synthesis and Reactivity ofbenzalacetophenone
   a. Bromination (Electrophilic additions) andsubsequentdebromination (Elimination)
   b. Epoxidation (Cycloaddition, nucleophilic) and ring opening with hydroxideion.
   c. Michael addition ofaniline.
   d. Conversion of benzalacetophenone to its oxime (nucleophilic addition atC=O)
   e. Conversion of oxime to amide (Beckmann rearrangement) and oxazole
   (Understand the reactivities at conjugated C=O and C=C) bond.
2. Synthesis of Cyclohexene from cyclohexanol and its conversion to 1, 2- *cis* and 1, 2- *trans* –cyclohexanediols.
   a. Epoxidation with peracid (Cycloaddition) and *anti*- ring opening with sodium hydroxide to *cis*- cyclohexane -1, 2-diol.
   b. Dihydroxylation with$KMnO_4$
   (Mechanism of *syn*- and *anti*-cyclohexane-1,2-diol)
3. Preparation and characterization of the Aldol-dehydration products from various combinations of aromatic aldehydes andketone.
   Effect of substituents on aromatic aldehydes on the product distribution.
   a. Aldehyde:benzaldehyde, 4-methylbenzaldehyde.4-methoxybenzaldehyde.
   b. Ketone: acetone, cyclopentanons, cyclohexanone (Book4) 6.

Books Recommended:

1. An Introduction to Modern Experimental Organic Chemistry, R.M. Roberts, J.C. Gilbert, L.B. Rodewald and A.S Wingrove, Holt Rinehart and Winston Inc, New York.1969.
2. Vogel's Text Book of Practical OrganicChemistry.
3. Laboratory Experiments on Organic Chemistry, R. Edemas, J.R. Johnson andC.F. Wilcox, The Macmillan Limited, London, 1970.
4. Modern Projects and Experiments in Organic Chemistry,J.R.Mohrig,C.N. Hammonad, P.F. Schatz and T.C. Morrill, W.H. Freeman and Company, New York 2003.

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHP-4085
COURSE TITLE: Advanced Practical- Inorganic Synthesis

Course outcome:

Students will be able to

CO1: apply key concepts of inorganic chemistry and coordination compounds including those related to synthesis, reaction chemistry, and structure and bonding

CO2:design the basic and advanced laboratory procedures used in inorganic synthesis

CO3:interpret and characterise the metal complexes through various spectrpscopic and analytical techniques

CO4: learn separation of metal cations by chromatographic techniques

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHP-4085
COURSE TITLE: Advanced Practical- Inorganic Synthesis

Time: 6 Hrs **Max. Marks: 75**
Credit (LTP): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya,Jalandhar.

1. Synthesis of the Linkage Isomers nitrito- and nitropentaamminecobalt(III)chloride
   a) Preparation of chloropentaamminecobalt(III) chloride, $[Co(NH_3)_5Cl]Cl_2$.
   b) Preparation of nitropentaamminecobalt(III) chloride, $[Co(NH_3)_5(NO_2)]Cl_2$.
   c) Preparation of nitritopentaamminecobalt(III) chloride, $[Co(NH_3)_5(ONO)]Cl_2$.
   d) Estimate the chloride in all the complexes using gravimetricanalysis.
   e) Record and interpret the electronic absorption spectra and IR spectra of allcobalt(III) complexes and assign the observed change to distinguish the twoisomers.
2. Synthesis of a coordination compound containing iron and analysis of thiscompound using redoxmethods
   a) Preparation of iron(II)oxalate
   b) Preparation of$K_3[Fe(C_2O_4)_3].3H_2O$
   c) Characterization of Iron(II) and iron(III) complex with IRspectroscopy
   d) Determination of iron and oxalate in $K_3[Fe(C_2O_4)_3].3H_2O$ using volumetricanalysis
3. Synthesis and characterization of the Ni(II) complex of a Schiff-base ligand derivedfrom Salicylaldehyde and ethylenediamine.
   a) Synthesis the Schiff-baseligand.
   b) Interpret the 1H NMR and IR spectra of theligand.
   c) Synthesis the Ni(II) complex of the ligand and compare its IR spectrum with thatoftheligand.
4. Separation of the metal cationsby
   a) Column chromatography with gradient elution Co(II) and Ni(II). Analyze qualitatively the coloured fractions collected for separatedcations.
   b) Paper chromatography [Fe(II), Co(II), Ni(II) and Cu(II). Determine the Rf values for the separate standard cations and use these to identify the cations present in the unknownmixture.

Books Recommended:

1. G. Marr, B. W. Rockett, Practical Inorganic Chemistry(1972).
2. *I. Grenthe, E. Nordin,* Inorganic Chemistry, *18 (1979)1869–74.*
3. *J.C. Bailar, M. Eldon, Inorg. Synth. 1 (1939)35–38.*

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHP-4086
COURSE TITLE: Advanced Practical- Physical Chemistry

Course outcome:

Students will be able to

CO1:experience the scientific methods employed in basic and applied physical chemistry

CO2: design and perform experiments to determine the rate and order of chemical reactions by varying concentrations and/or temperature

CO3: measure equilibrium concentrations and equilibrium constants for acid-base, solubility, and complexation reactions given initial concentrations of reactant

CO4: develop skills in procedures and instrumental methods like turbidimetry and spectrophotometry.

Master of Science (Chemistry)
(Semester-IV)
Session: 2024-25
COURSE CODE: MCHP-4086
COURSE TITLE: Advanced Practical- Physical Chemistry

Time: 6 Hrs **Max. Marks: 75**
Credit (LTP): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

CHEMICAL EQUILIBRIUM

1. Study the effect of solvent on the conductance of $AgNO_3$/Acetic acid and determine the degree of dissociation and equilibrium constant in different solvents and their mixtures (DMSO, DMF, dioxane, acetone, and water) and test the validity of DEBYE- HUCKEL-ONSAGER'Sequation.
2. To determine acid and base dissociation constant of amino acid pHmetrically.
3. To calculate thermodynamic parameters ,for the reaction
   $Zn + Hg_2SO_4 \longrightarrow 2Hg + Zn\ SO_4$ by emf measurement.

CHEMICAL KINETICS

4. Study the salt effects and the solvent effect on the rate law of alkaline hydrolysis of crystal violet.
5. Determine the degree of hydrolysis and hydrolysis constant of CH_3COONa/NaCl/aniline hydrochloride.
6. Determine the order of reaction by analyzing the kinetic dependence ofindividual reactant (e.g. saponification of ester).
7. Determine the energy of activation for the reaction studied above.

ACTIVITY AND ACTIVITY COEFFICIENTS

8. Determination of mean activity coefficient of given electrolyte by cryoscopy.
9. Determine activity coefficients by EMF method.

PHASE EQUILIBRIUM

10. Draw the phase diagram for any one of the following three componentpartially immiscible liquidsystems.
    i) DMSO/water/benzene ii) water/benzene/aceticacid

SPECTROPHOTOMETRIC METHODS

11. To study the effect of extended conjugation on the wave length of maximum absorption of organic compounds.

TURBIDITYMETRY

12. To determine concentration of sulphate ions with the help of turbidity meter.
13. Determine the CMC by turbidimetric method.
14. Preparation of soap and determination of its CMC.

LEAST SQUARE FITTING

15. To draw calibration curve for the concentration determination of potassium ions by flame photometry and to study the least square fitting of the data.

POLARIMETRY

1. To find the specific rotation and molecular rotation of glucose polarimetrically and also find the concentration of unknown solution. Calculate the intrinsic rotation for glucose.
2. To find out the percentage of two optically active substances such as d-sugar and d-tartaric acid in a given solution polarimetrically.
3. To determine the specific rotation of camphor in benzene or carbon tetrachloride.

Books Recommended:

1.Yadav, J. B (2005): *Advanced Practical Physical Chemistry*, 22nd edition, Goel publishing House, Krishna Prakashan Media Ltd.
2. Venkatesan, V,Veeraswamy, R and Kulandaivelu, A.R (1997): *Basic Principles of Practical Chemistry*", 2nd edition, Sultan Chand and Sons Publication, New Delhi.
3. Findlay's (1985): *Practical Physical Chemistry*, Revised and edited by B.P. Levitt 9 th edition, Longman, London.
4. Chatwal, G.R. and Anand,S.K (2000): *Instrumental Methods of Chemical Analysis*, Himalaya Publishing House, Delhi.

Annexure C

FACULTY OF SCIENCES

SYLLABUS

of

Chemistry

for

Bachelor of Science (Semester III)

(UnderContinuous Evaluation System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Session: 2024-25)

Chemistry

Bachelor of Science (Semester III)												
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credit**	**Course Code**		**Course Type**	**Total marks**		**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
										L	**P**		
Chemistry	2-0-0	2-0-0	7	BSMM-3084	I	C	175	50	Chemistry (Organic Chemistry)	40	-	10	3
	3-0-0	3-0-0			II			75	Chemistry (Physical Chemistry)	60	-	15	3
	0-0-4	0-0-2		BSNM-3084	P			50	Chemistry (Practical)	-	40	10	3.5

Bachelor of Science
(SEMESTER–III)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-3084(I)
COURSE TITLE: CHEMISTRY (ORGANIC CHEMISTRY)

Course outcomes:

Students will be able to

CO1: to resolve the different enantiomers and differentiate between dextrorotatory-leavorotatory chiral and achiral compounds,understand the concept of isomerism, axial and equatorial bonds.

CO2: understand the methods of formation, chemical reactions, acidic character of alcohols

CO3: preparation of understand structure and bonding phenols, acidic character of phenols

CO4: compare reactivity of aliphatic and aromatic aldehydes and ketones, to understand the various reactions given by carbonyl compounds

Bachelor of Science
(SEMESTER–III)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-3084(I)
COURSE TITLE: CHEMISTRY (ORGANIC CHEMISTRY)

Exam Time: 3Hrs. **Max.Marks:50**

Credit(L-T-P): 2-0-0 **(Theory: 40, CA: 10)**

Instructions for the Paper Setter

Eight questions of equal marks (8 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions,selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit I

Stereochemistry of Organic Compounds

Concept of isomerism, types of isomerism, Optical isomerism, elements of symmetry, molecular chirality, enantiomers, stereogenic centre, optical activity, properties of enantiomers, chiral and achiral molecules with two stereogeniccentres, diastereomers, threo and erythro diasteremers, meso compounds, resolution of enantiomers, inversion, retention and racemization. Relative and absolute configuration, sequence rules, D and L and R and S systems of nomenclature. Geometric isomerism–determination of configuration of geometric isomers. E and Z system of nomenclature. Conformational isomerism–conformational analysis of ethane and n–butane; conformation of cyclohexane, axial and equatorial bonds, Newman projection and Sawhorse formulae, Fischer and flying wedge formulae. Difference between configuration and conformation.

Unit–II

Alcohols

Classification and nomenclature.Monohydric alcohols—nomenclature, Acidic nature, Reactions of alcohols, Dihydric alcohols—nomenclature, methods of formation, chemical reactions of vicinal glycols, oxidative cleavage [$Pb(OAc)_4$] and [HIO_4] and pinacol-pinacolone rearrangement.

Unit–III

Phenols

Nomenclature, structure and bonding, preparation of phenols, physical properties and acidic character, Comparative acidic strengths of alcohols and phenols, resonance stabilization of phenoxide ion.Reactions of phenols—electrophilic aromatic substitution, acylation and carboxylation.Mechanisms of Fries rearrangement, Claisen rearrangement, Gatterman synthesis, Reimer Tiemann reaction.

Unit–IV

Aldehydes and Ketones

Nomenclature and structure of the carbonyl group. Synthesis of aldehydes and ketones with particular reference to the synthesis of aldehydes from acid chlorides, synthesis of aldehydes and ketones using 1,3-dithianes, synthesis of ketones from nitriles and from carboxylic acids. Physical properties.Mechanism of nucleophilic additions to carbonyl group with particular emphasis on benzoin, aldol, Perkin and Knoevenagel condensations. Witting reaction,Mannich reaction.Oxidation of aldehydes, Baeyer-Villiger oxidation of Ketones, Cannizzaro reaction. MPV, Clemmensen, Wolff-Kishner, $LiAlH_4$ and $NaBH_4$ reductions. Halogenation of enolizable ketones.

Books suggested:

1. Morrison, R.T., Boyd, R.N., Organic Chemistry; 6th edition, Pubs: Prentice-Hall, 1992.
2. Wade Jr., L.G., Singh, M.S., Organic Chemistry; 6th edition, Pubs: Pearson Education, 2008.
3. Mukherji, S.M., Singh, S.P., Kapoor, R.P., Organic Chemistry; Pubs: Wiley Eastern Limited, 1985, Vol. I, II, III.
4. Solomons, T.W., Fryhle, C.B., Organic Chemistry; 9th edition, Pubs: Wiley India, 2007.
5. Carey, F.A., Organic Chemistry; 4th edition, Pubs: McGraw-Hill, 2000.
6. Streitwieser, A., Clayton, Jr., Heathcock, H., Introduction to Organic Chemistry; 3rd edition, Pubs:Macmillan Publishing Company, 1989.
7. University General Chemistry, C.N.R. Rao, Macmillan.

Bachelor of Science
(SEMESTER–III)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-3084(II)
COURSE TITLE: CHEMISTRY (PHYSICALCHEMISTRY)

Course outcomes:

Students will be able to

CO1: understand and evaluate thermodynamic property of any system and its applications to various systems, acquire the knowledge of phase equilibria of various systems

CO2: demonstrate the carnot cycle, understand the concept of Entropy

CO3: understand the concept of Residual entropy, demonstrate Clausius-Clapeyron equation, CO4: understand concept of spontaneity of a reaction in terms of free energy change.

CO4: understand and demonstrate the concept of phase equilibria of one component system, two component system

Bachelor of Science
(SEMESTER–III)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-3084(II)
COURSE TITLE: CHEMISTRY (PHYSICALCHEMISTRY)

Exam Time: 3Hrs. **Max.Marks:75**

Credit(L-T-P): 3-0-0 **(Theory: 60, CA: 15)**

Instructions for the Paper Setter

Eight questions of equal marks (12 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions,selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Thermodynamics-I Definition of thermodynamic terms: System, surroundings etc. Types of systems, intensive and extensive properties. State and path functions and their differentials. Thermodynamic process. Concept of heat and work.

First Law of Thermodynamics:

Statement, definition of internal energy and enthalpy. Heat capacity, heat capacities at constant volume and pressure and their relationship. Joule's law-Joule-Thomson coefficient and inversion temperature, Calculation of w,q,dUanddH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process.

Thermochemistry:

Standard state, standard enthalpy of formation-Hess's Law of heat summation and its applications. Heat of reaction at constant pressure and at constant volume. Enthalpy of neutralization. Bond dissociation energy and its calculation from thermo-chemical data, temperature dependence of enthalpy. Kirchhoff's equation.

Unit–II

Thermodynamics-II

Second Law of Thermodynamics: Need for the law, different statements of the law, Carnot cycle and its efficiency, Carnot theorem. Thermodynamic scale of temperature.

Concept of Entropy: Entropy as a state function, entropy as a function of V and T, entropy as a function of P and T, entropy change in physical change, Clausius inequality, entropy as a criteria of spontaneity and equilibrium. Entropy change in ideal gases and mixing of gases.

Unit–III

Thermodynamics-III

Third Law of Thermodynamics: Nernst heat theorem, statement and concept of residual entropy, evaluation of absolute entropy from heat capacity data. Gibbs and Helmholtz functions; Gibbs function (G) and Helmholtz function (A) as thermodynamic quantities, A and G as criteria for thermodynamic equilibrium and spontaneity, their advantage over entropy change, Variation of G and A with P,V and T.

Chemical Equilibrium

Equilibrium constant and free energy. Thermodynamic derivation of law of mass action. Determination of K_p, K_c, $K_a$and their relationship, Clausius-Clapeyron equation, applications.

Unit–IV

Introduction to Phase Equilibrium

Statement and meaning of the terms-phase, component and degree of freedom, derivation of Gibbs phase rule, phase equilibria of one component system-water, CO_2 and S systems. Phase equilibria of two component systems-solid-liquid equilibria, simple eutectic-Bi-Cd, Pb-Ag systems, desilverisation of lead. Solid solutions-compound formation with congruent melting point (Mg-Zn) and incongruent melting point, ($NaCl$-H_2O), $FeCl_3$-H_2O) and $CuSO_4$-H_2O) system. Freezing mixtures, acetone-dry ice. Non-ideal system-azeotropes-HCl-H_2O and ethanol-water system. Partially miscible liquids Phenol-water, trines-thylamin-water, Nicotine-water System. Lower and upper consulate temperature, Effect of impurity on consolute temperature, immiscible liquids, steam distillation. Nernst distribution law-thermodynamic derivation and applications.

Books suggested:

1. Atkins, P., Paula, J.de, Atkins Physical Chemistry; 8th edition, Pubs: Oxford University Press, 2008.

2. Puri, B.R., Sharma, L.R., Pathania, M.S., Principles of Physical Chemistry; 43rd edition, Pubs: Vishal Publishing Co., 2008.

3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Inc, 1996.
4. Rao, C.N.R., University General Chemistry; Pubs: Macmillan India, 1985.
5. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
6. Albert, R.A., Silbey, R.J., Physical Chemistry; 1st edition, Pubs: John Wiley and Sons Inc., 1992.
7. Dogra, S.K., Dogra, S., Physical Chemistry Through Problems; Pubs:Wiley Eastern Limited, 1991.
8. Levine, I.N., Physical Chemistry; 5th edition, Pubs: Tata McGraw Hill Publishing Co. Ltd., 2002.
9. Moore, W. J., Basic Physical Chemistry; Pubs: Prentice Hall of India Pvt. Ltd, 1983.
10. Metz, C.R., Theory and Problems of Physical Chemistry; Schaum's outline series, 2nd edition, Pubs: McGraw-Hall Book company, 1989.

Bachelor of Science
(SEMESTER–III)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-3084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to

CO1: understand and master the technique of volumetric analysis, analyze an acidic and alkali content in different samples,

CO2: To analyze calcium content in various samples permanganometricall, understand the concept of hardness of water and its analysis by EDTA method

CO3: understand and master the technique of gravimetric analysis

CO4: to understand the concept of TLC and its applications

Bachelor of Science
(SEMESTER–III)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-3084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Duration: 3½ Hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar.

Quantitative Analysis

Volumetric Analysis

a. Determination of acetic acid in commercial vinegar using NaOH.

b. Determination of alkali content-antacid tablet using HCI.

c. Estimation of calcium content in chalk as calcium oxalate by permanganometry.

d. Estimation of hardness of water by EDTA.

e. Estimation of ferrous and ferric by dichromate method.

f. Estimation of copper using sodiumthiosulphate.

Gravimetric Analysis

Analysis of Cu as CuSCN and Ni as Ni (dimethylgloxime)

Organic Chemistry Laboratory Techniques

Thin Layer Chromatography

Determination of R_f values and identification of organic compounds.

(a). Separation of green leaf pigments (spinach leaves may be used).

(b). Preparation and separation of 2, 4. dinitrophenylhydrazones of acetone, 2-butone, 2-Butanone, hexan-2 and 3-one using toluene and light petroleum (40 : 60).

(c). Separation of a mixture of dyes using cyclohexane and ethyl acetate (8.5:1.5).

Books suggested:

1. Vogel's Textbook of Quantitative Inorganic Analysis (revised), J. Bassett, R.C. Denney, G.H. Jeffery and J. Mandham, ELBS.
2. Standard Methods of Chemical. Analysis, W.W. Scott: The Technical Press.
3. Experimental Inorganic Chemistry, W.G. Palmer, Cambridge.
4. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
5. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
6. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.
7. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill

FACULTY OF SCIENCES

SYLLABUS

of

Chemistry

For

Bachelor of Science

(Semester IV)

(Under Continuous Evaluation System)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science

(Session: 2024-25)

Bachelor of Science (Semester IV)												
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credit**	**Course Code**		**Course Type**	**Total marks**		**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
										L	**P**		
Chemistry	3-0-0	3-0-0	7	BSMM-4084	I	C	175	75	Chemistry (Inorganic Chemistry)	60	-	15	3
	2-0-0	2-0-0			II			50	Chemistry (Organic Chemistry)	40	-	10	3
	0-0-4	0-0-2		BSNM-4084	P			50	Chemistry (Practical)	-	40	10	3.5

Bachelor of Science
(SEMESTER–IV)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-4084(I)
COURSE TITLE: CHEMISTRY (INORGANIC CHEMISTRY)

Course outcomes:

Students will be able to

CO1: understand the key features of coordination compounds viz. Nomenclature, Isomerism and electronic configurations of coordination compounds, have general knowledge of Chelates, Postulates of VBT
CO2: understand theproperties and reactions of non-aqueous solvents.
CO3: write both reduction and oxidation half reactions for a simple redox reaction , Frost and understand the Latimer Pourbaix diagram.
CO4: understand the positions,electronic configurations,relative stability,preparation, properties, structures and characteristics of the f-block elements in the periodic table and understand the role of metal ions and other inorganic elements in biological systems

Bachelor of Science
(SEMESTER–IV)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-4084(I)
COURSE TITLE: CHEMISTRY (INORGANIC CHEMISTRY)

Exam Time: 3Hrs. **Max.Marks:75**

Credit(L-T-P): 3-0-0 **(Theory: 60, CA: 15)**

Note: Instructions for the Paper Setter

Eight questions of equal marks (12 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Coordination Compounds **(10 Hrs)**

Werner's coordination theory and its experimental verification, effective atomic number concept, chelates, nomenclature of coordination compounds, isomerism in coordination compounds, valence bond theory of transition metal complexes

Non-AqueousSolvents **(5 Hrs)**

Physical properties of a solvent, types of solvents and their general characteristics, reactions in non-aqueous solvents with reference to liquid NH_3 and liquid SO_2.

Unit–II

Oxidation and Reduction **(8 Hrs)**

Use of redox potential data-analysis of redox cycle, redox stability in water, Frost, Latimer and Pourbaix diagrams

Chemistry of Lanthanide Elements **(7 Hrs)**

Electronic structure, oxidation states and ionic radii and lanthanide contraction. Electronic absorption and magnetic properties of lanthanides

Unit–III

Chemistry of Actinides **(5 Hrs)**

General features and chemistry of actinides, similarities between the later actinides and the later lanthanides. Electronic and magnetic properties of actinides and their general comparison with the lanthanide elements

Unit–IV

Bioinorganic Chemistry **(10 Hrs)**

Essential and trace elements in biological processes, metalloporphyrins and special reference to haemoglobin and myoglobin. Biological role of alkali and alkaline earth metal ions with special reference to Ca^{2+}

Books Suggested:

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 3rd edition, Pubs: John Wiley Sons. 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman Hall Ltd., 1991.
3. Shriver, D.E., Alkins, P.W., Langford, C.H., Inorganic Chemistry; 4th edition, Oxford Publisher: Oxford University Press, 2006.
4. Douglas, B. McDamiel, D., Alexander, J., Concepts and Models of Inorganic Chemistry; 3rd edition, Pubs: John Wiley and Sons Inc., 1994.
5. Porterfield, W.W., Wesley, A., Inorganic Chemistry; Pubs: Addison-Wesley Publishing Company, 1984.
6. Miessler, G.L., Larr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson Education Inc., 2004.
7. Jolly, W.L., Modern Inorganic Chemistry; 2nd edition, Pubs: McGraw-Hill Publishing Company Limited, 1991.
8. Purcell, K.F., Kotz, J.C., Inorganic Chemistry; Pubs: W.B. Saunders Company, 1977.
9. Puri, B.R., Sharma, L.R., Kalia, K.C., Principles of Inorganic Chemistry; 30th edition, Pubs: Milestones Publisher, 2006-07.
10. Inorganic Chemistry, W.W. Porterfield Addison-Wesley.
11. Inorganic Chemistry, A.G. Sharpe, ELBS.
12. University General Chemistry, C.N.R. Rao, Macmillan.

Bachelor of Science
(SEMESTER–IV)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-4084(II)
COURSE TITLE: CHEMISTRY (ORGANIC CHEMISTRY)

Course outcomes:

Students will be able to

CO1: understand structure and bonding in carboxylic acids and carboxylic acid derivatives, Compare the acidity of alcohols,phenols and acids

CO2: understand preparations and reactions of ethers and epoxides, understand cleavages in ethers, the ring opening reactions of epoxides

CO3:understand preparation and reactions of nitroalkanes and nitroarenes, differentiate between primary, secondary and tertiary amines, basicity of amines

CO4:understand nomenclature, structural features, methods of formation and chemical reactions of Organomagnesium, Organolithium, Organozinc and Organocopper compounds and to know the various methods of synthesis and compare electrophilic substitution, basicity, reactions of pyrrole, furan, thiophene and nucleophilic substitution reactions of pyridine.

Bachelor of Science
(SEMESTER–IV)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-4084(II)
COURSE TITLE: CHEMISTRY (ORGANIC CHEMISTRY)

Exam Time: 3Hrs. **Max.Marks:50**

Credit(L-T-P): 3-0-0 **(Theory: 40, CA: 10)**

Note: Instructions for the Paper Setter

Eight questions of equal marks (8 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit–I

Carboxylic Acids and its derivatives **(10 Hrs)**

Nomenclature and structure of carboxylic acids, acid chlorides, esters, amides and acid anhydrides, physical properties, acidity of carboxylic acids, effects of substituents on acid strength.Reactions of carboxylic acids.Hell-Volhard-Zelinsky reaction.Synthesis of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism of decarboxylation. Relative stability and reactivity of acyl derivatives. interconversion of acid derivatives by nucleophilic acyl substitution. Chemical reactions of carboxylic acid derivatives, Mechanisms of esterification and hydrolysis (acidic and basic).

Unit–II

Ethers and Epoxides **(10 Hrs)**

Nomenclature of ethers and methods of their formation, physical properties.Chemical reaction- cleavage and autoxidation, Ziesel'smethod.Synthesis of epoxides. Acid and base-catalyzed ring opening of epoxides, orientation of epoxide ring opening, reactions of Grignard and organolithium reagents with epoxides.

Unit-III

Organic Compounds of Nitrogen **(10 Hrs)**

Structure and nomenclature of amines, Methods of preparation of amines by Reductive amination of aldehydic and ketonic compounds, Gabriel-phthalimide reaction and Hoffmann bromamide reaction.Physicalproperties.Stereochemistry of amines.separation of a mixture of primary, secondary and tertiary amines. Structural features affecting basicity of amines. Amine salts as phase-transfer catalysts.

Unit–IV

Organometallic Compounds **(7 Hrs)**

Organomagnesium Compounds: The Grignard reagents formation, structure and chemical reactions. Organolithium Compounds: Formation and chemical reactions.

Heterocyclic Compounds **(8 Hrs)**

Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis. Mechanism of electrophilic substitution reactions of pyrrole, furan, thiophene and pyridine. Mechanism of nucleophilic substitution reactions in pyridine.Comparison of basicity of pyridine, piperidine and pyrrole.

Book Suggested:

1. Morrison, R.T., Boyd, R.N., Organic Chemistry; 6th edition, Pubs: Prentice-Hall, 1992.
2. Wade Jr., L.G., Singh, M.S., Organic Chemistry; 6th edition, Pubs: Pearson Education, 2008.
3. Mukherji, S.M., Singh, S.P., Kapoor, R.P., Organic Chemistry; Pubs: Wiley Eastern Limited, 1985, Vol.I, II, III.
4. Solomons, T.W., Fryhle, C.B., Organic Chemistry; 9th edition, Pubs: Wiley India, 2007.
5. Carey, F.A., Organic Chemistry; 4th edition, Pubs: McGraw-Hill, 2000.
6. Streitwieser, A., Clayton, Jr., Heathcock, H., Introduction to Organic Chemistry; 3rd edition, Pubs: Macmillan Publishing Company, 1989.
7. Introduction to Organic Chemistry, Sireitwieser, Heathcock and Kosover, Macmilan.

Bachelor of Science
(SEMESTER–IV)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-4084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to analyze the given organic compound through

CO1:understand the basics of Qualitative analysis

CO2: detection of elements (N, S and halogens) in organic compounds.

CO3:detection of functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, amines,amides, nitro and anilide) in simple organic compounds

CO4: preparation of their derivatives

Bachelor of Science
(SEMESTER–IV)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-4084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Duration: 3½ hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, KanyaMahaVidyalaya, Jalandhar.

Qualitative Analysis

Detection of elements: N, S and halogens

Detection of functional groups:phenolic, carboxylic, carbonyl, esters, carbohydrates, amines, amides, nitro and anilide in simple organic compounds and preparing their derivatives.

Practical Examination

1) Detection of Elements, functional group and derivative preparation	15
2) Viva-Voce	03
3) Note Book	02

Book Suggested:

1. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
2. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
3. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.

FACULTY OF LIFE SCIENCES

SYLLABUS

of

Chemistry

for

Bachelor of Science (Biotechnology) (Semester III)

(UnderContinuous Evaluation System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Biotechnology) (Session 2024-25)

Chemistry

Bachelor of Science (Biotechnology) Semester-III										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	Th	P	CA	
BBTL-3083	Chemistry-II	C	2-0-0	2-0-0	2	50	40	-	10	3
BBTP-3089	Lab in Chemistry-II	C	0-0-2	0-0-1	1	25	-	20	05	3.5

Bachelor of Science (Biotechnology)

(Semester-III)

SESSION: 2024-25

COURSE CODE: BBTL-3083

COURSE TITLE: Chemistry-II
(Theory)

Course outcome:

Students will be able to

CO1:explain the various reactive intermediates.

CO2:explain the bonding between different organic compounds

CO3: explain the effect of various substituents on the reactivity of aromatic compounds

CO4:learn Molecular chirality, enantiomers, the Cahn-Ingold Prelog R-S notational system, Resolution of enantiomers, chiral centres other than carbon.

CO5: understand mechanism of nucleophilic substitution , stereochemistry of SN^1 and SN^2 reactions

Bachelor of Science (Biotechnology)

(Semester-III)

SESSION: 2024-25

COURSE CODE: BBTL-3083

COURSE TITLE: Chemistry-II

(Theory)

Exam Time: 3Hrs. **Max.Marks:50**
Credit(L-T-P): 2-0-0 **(Theory: 40, CA: 10)**

Instructions for the Paper Setters:

Eight questions of equal marks (8 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Reactive intermediates

Carbocations, carbanions, free radicals, carbenes, arenes and nitrenes(with examples). Assigning formal charges on intermediates and other ionic species

Bonding

Hybridization, bond lengths and bond angles, bond energy, localized and delocalized chemical bond, Van der Waals interactions, resonance, hyperconjugation, hydrogen bonding and Inductive and electrometric effects.

UNIT-II

Aromaticity

Aromatic electrophilic substitution–general pattern of the mechanism, role of σ and π complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, orientation and ortho/para ratio. Side chain reactions of benzene derivatives. Methods of formation and chemical reactions of alkylbenzenes

UNIT-III

Stereochemistry: Molecular chirality, enantiomers/symmetry in achiaral structures, chiral centres in chiral molecules, properties of chiral molecules-optical activity, absolute and relative configuration, the Cahn-Ingold Prelog R-S notional system physical properties of enantiomers. Stereochemistry of chemical reactions that produce chiral centres, chemical reactions that produce stereoisomers, Resolution of enantionmers, chiral centres other than carbon, prochirality.

UNIT-IV

Nucleophilic substitution :Functional group transformation by nucleophilic substitution, the biomolecular (SN^2), mechanism of nucleophilic substitution , stereochemistry of SN^2 reactions, how SN^2 reactions occur, steric effect in SN2reactions, nucleophiles and nucleophilicity, the unimolecular (SN^1) mechanism of nucleophilies substitution, carbocation stability and the rate of substitution, by the SN^1 mechanism sterochemistry of SN1reactions, carbocation real arrangements in SN^1 reactions, solvent effects, subtitution and elimination as competing reactions.

Books Recommended:

1. R.T. Morison and R.N. Boyd, Organic chemistry
2. I. L. Finar, Organic Chemistry, Vol.I, IV ed. J. March, Advanced Organic Chemistry, Reactions Mechanisms and Structure.
3. Schaum's Outlines Series, Theory and Problems of Organic chemistry.
4. I.L. Finar, Problems and their solution in Organic chemistry.
5. J. D. Robert and M. C. Caserio, Modern Organic Chemistry.
6. D. J. Cram and G. S. Hammond, Organic chemistry.
7. J. E. Banks, Naming Organic Compounds - Programmed Introduction to Organic Chemistry
8. E.L. Eliel, Stereochemistry of carbon compounds.
9. W. Camp, Organic Spectroscopy.
10. F. A. Carey, Organic chemistry

Bachelor of Science (Biotechnology)

(Semester-III)

SESSION: 2024-25

COURSE CODE: BBTP-3089

COURSE TITLE: Lab in Chemistry-II

Course outcome:

Students will be able to

CO1.Detect elements (N, S and halogens) in simple organic compounds

CO2: Detect functional groups (Aldehydes, ketones carbohydrates, hydrocarbons, Amides ,Amines Carboxylic acids and phenols) in simple organic compounds

CO3: Prepare the derivatives of organic compounds.

CO4: Confirm the unknown organic compounds by determining its M.P.

Bachelor of Science (Biotechnology)

(Semester-III)

SESSION: 2024-25

COURSE CODE: BBTP-3089

COURSE TITLE: Lab in Chemistry-II

Exam Time: 3.5 Hrs **Max. Marks: 25**

Credit (L-T-P): 0-0-1 **(Practical: 20, CA: 05)**

Instructions for the practical Examiner: Question paper is to be set on the spot jointly by the internal and external examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

Organic qualitative analysis:

Complete identification including derivation of following organic compounds:

- Amides

- Amines

- Carboxylic acids and phenols.

Organic qualitative analysis:

Complete identification including derivation of following organic compounds:

- Aromatic hydrocarbons

- Aldehydes

- Ketones

- Carbohydrates

Books Recommended:

Arthur Vogel (1978), Vogel's Textbook of practical organic chemistry, including qualitative organic analysis, 4th ed., Longman Scientific and Technical

FACULTY OF SCIENCES

SYLLABUS

of

Chemistry

for

Bachelor of Science (Home Science) (Semester III)

(Credit Based Continuous Evaluation Grading System)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Session 2024-25

Bachelor of Science (Home Science) **Semester III**									
Program Name	**Course Title**	**Course Type**	**Course Code**	**L-T-P**	**Marks**				
					Total	**Ext.**		**CA**	**Examination time (in Hours)**
						L	**P**		
Bachelor of Science (Home Science)	Basic Chemistry	C	BHSM-3087	3-0-1	100	60	20	20	3+3

Bachelor of Science (Home Science)

(Semester-III)

SESSION: 2024-25

COURSE CODE: BHSM-3087

COURSE TITLE: BASIC CHEMISTRY
(Theory)

Course outcomes:

Students will be able to:

CO1: understand the composition and properties of different chemical compounds used in daily life

CO2: understand the atomic structure, acquire knowledge about various atomic models

CO3: understand postulates of VBT

CO4: understand the concept of normality, molarity, molality and strength of solution and knowledge of fibers, pH of water, hard water

Bachelor of Science (Home Science)

(Semester-III)

SESSION: 2024-25

COURSE CODE: BHSM-3087

COURSE TITLE: BASIC CHEMISTRY
(Theory)

Exam Time: 3Hrs. **Max.Marks: 60**
Credit(L-T-P): 3-0-0

Instructions for the Paper Setters:

Eight questions of equal marks (12 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Symbols, formulae, valency, variable valency, elementary idea of mole concept, imperial formulae and molecular formulae, definition of atomic and molecular weight. Chemical equation and reaction parts, types, essentials, implications and limitations of chemical equation, balancing of equation hit trial method, exothermic, endothermic, catalytic and reversible reaction.

Unit-II

Atomic structure, elementary idea of electron, proton, neutron arrangement of fundamental particles in an atom. Rutherford atomic model, atomic number, mass number, isotopes, isobars, Bohr's atomic model (postulates)

Unit-III

Chemical bonding, definition of chemical bond, cause of chemical combination, types of chemical bonds, ionic bonds, covalent bond, coordinate bond,(definition and simple examples based on electron dot picture)example include H_2, Cl_2, O_2, NH_3, CH_4, C_2H_2, MgF_2, CaO, NH_4^+, H_3O^+

Unit-IV

Elementary idea about normality, morality, molality and strength of solution. Structure of fibers (Natural and synthetic). Hard water, its cause and type, heavy water with its uses.

Books recommended:

1. N.C.E.R.T. Books for XI & XH.
2. Modern Approach to Chemistry by S. P. Johar Vol. I & Vol. II.

Bachelor of Science (Home Science)
(Semester-III)
SESSION 2024-25
Course Code: BHSM-3087(P)
COURSE TITLE: BASIC CHEMISTRY
(Practical)

Course Outcomes

After passing this course the student will be able to:

CO1: prepare the solutions of different normalities and molarities.

CO2: calculate the strength of solutions of different normalities and find out the percentage purity of the given sample solution.

CO3: compare the hardness of the various water samples.

CO4: to do Chemical testing of different Textile fibres (cotton, wool, silk, synthetic fibres).

Bachelor of Science (Home Science)
(Semester-III)
SESSION 2024-25
Course Code: BHSM-3087(P)
COURSE TITLE: BASIC CHEMISTRY
(Practical)

Time: 3 Hrs **Practical Marks: 20**

Credit(L-T-P): 0-0-1

Instructions for the practical Examiner: Question paper is to be set on the spot jointly by the internal and external examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

1. Preparation of standard solution.
2. To determine the normality and strength of given alkali solution.
3. To determine the percentage purity of given sample of alkali solution
4. Volumetric titration for estimation of hardness of water.
5. Chemical testing of Textile fibers (cotton, wool, silk, synthetic fibers)

FACULTY OF SCIENCES

SYLLABUS

of

Chemistry

for

Bachelor of Science (Home Science) (Semester IV)

(Credit Based Continuous Evaluation Grading System)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Session 2024-25

Bachelor of Science (Home Science) **Semester IV**									
Program Name	**Course Title**	**Course Type**	**Course Code**	**L-T-P**	**Marks**				
					Total	**Ext.**		**CA**	**Examination time (in Hours)**
						L	**P**		
Bachelor of Science (Home Science)	Applied Chemistry	C	BHSM-4087	3-0-1	100	60	20	20	3+3

Bachelor of Science (Home Science)

(Semester-IV)

SESSION: 2024-25

COURSE CODE: BHSM-4087

COURSE TITLE: APPLIED CHEMISTRY
(Theory)

Course outcomes:
After passing this course the student will be able to :

CO1: understand the composition and properties of different organic compounds used in daily life

CO2: understand structure and importance of rubbers and plastics.

CO3: understand about composition of cosmetics.

CO4: to have basic knowledge about fuels.

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Bachelor of Science (Home Science)

(Semester-IV)

SESSION: 2024-25

COURSE CODE: BHSM-4087

COURSE TITLE: APPLIED CHEMISTRY
(Theory)

Exam Time: 3Hrs. **Max.Marks: 60**
Credit(L-T-P): 3-0-0

Instructions for the Paper Setters:

Eight questions of equal marks (12 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Elementary idea about pH, Basic idea about acid bases & salt, Soaps and detergents, their structure, properties and preparation

UNIT-II

Plastics and rubber, their structure and uses

UNIT-III

Elementary idea about composition of cosmetics

UNIT-IV

Fuels for home

Books recommended:

1. N.C.E.R.T. Books for XI & XH.
2. Modern Approach to Chemistry by S. P. Johar Vol. I & Vol. II.

Bachelor of Science (Home Science)
(Semester-IV)
SESSION 2024-25
Course Code: BHSM-4087 (P)
COURSE TITLE: APPLIED CHEMISTRY
(Practical)

Course Outcomes

After passing this course the student will be able to:

CO 1: to determine the melting point of an organic compound

CO 2: to prepare soaps

CO 3: to determine the pH of an unknown sample

Bachelor of Science (Home Science)
(Semester-IV)
SESSION 2024-25
Course Code: BHSM-4087 (P)
COURSE TITLE: APPLIED CHEMISTRY
(Practical)

Time: 3 Hrs **Practical Marks: 20**

Credit(L-T-P): 0-0-1

Instructions for the practical Examiner: Question paper is to be set on the spot jointly by the internal and external examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

1. Determination of melting point of Organic compound.
2. Preparation of soap
3. Determination of pH of some samples

ANNEXURE D

FACULTY OF SCIENCES

SYLLABUS

of

Master of Science (Chemistry)

(Semester: I - II)

(Under Credit Based Continuous Evaluation Grading System)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR

(Autonomous)

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

Master of Science (Chemistry)
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)

Semester I

Master of Science (Chemistry) Semester I										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	**Th**	**P**	**CA**	
MCHL-1081	Ligand Field Theory	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-1082	Organic Reaction Mechanism-I	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-1083	Physical Chemistry – Thermodynamics	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-1084	Spectroscopy A: Techniques for Structure Elucidation of Organic Compounds	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHM-1135	Computer for Chemists	C	1-0-2	1-0-1	2	50	20	20	10	3+3
MCHP-1086	Inorganic Chemistry Practical (Quantitative Analysis)	C	0-0-6	0-0-3	3	75	-	60	15	3*2
MCHP-1087	Organic Chemistry Practical	C	0-0-6	0-0-3	3	75	-	60	15	3*2

Student can opt any one of the following Interdisciplinary optional courses		IDE			-					
Total					**24**	**600**				
IDEC-1101*	Communication Skills		4-0-0			100	80	-	20	3
IDEM-1362*	Basics of Music (Vocal)		2-1-1			100	40	40	20	
IDEH-1313*	Human Rights and Constitutional Duties		4-0-0			100	80	-	20	
IDEI-1124*	Basics of Computer Applications		2-0-4			100	50	30	20	3+3
IDEW-1275	Indian Heritage: Contribution to the world		4-0-0			100	80	-	20	3
(*Credits of these ID courses will not be added to SGPA)										

C- Compulsory Course

IDE- Inter Disciplinary Elective Course

Programme Specific Outcomes

On successful completion of this Programme, students will have ability to:

PSO1: do global level research, pursue Ph.D. programme and targeted approach of CSIR-NET examination and competitive exams conducted by service commission

PSO2: attain enormous job opportunities at all levels of chemical, pharmaceutical, food products and life oriented material industries.

PSO3: get recruitment in R and D and synthetic division of polymer industries and Allied division.

PSO4: apply modern methods of analysis to chemical systems in a laboratory setting.

PSO5: work effectively and safely in a laboratory environment, use technologies/instrumentation to gather and analyse data and work in teams as well as independently.

PSO6: think critically, develop scientific temper and analyse various chemical.

Master of Science (Chemistry)
(Semester-I)
Session 2024-25
COURSE CODE: MCHL-1081
Course Title: Ligand Field Theory

Course outcomes:

Students will be able to

CO1: learn mathematical rules for the formation of symmetry point groups

CO2: construct the Character table for various point groups and to determine the

symmetry of hybrid orbitals

CO3: analyze Tanabe – Sugano /Orgel diagrams and determine the magnetic properties of complexes.

CO4: analyze and understand the electronic spectra of octahedral and tetrahedral metal complexes.

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Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHL-1081
COURSE TITLE: Ligand Field Theory

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Symmetry

Symmetry elements, symmetry operations and their matrix representation, group postulates and types, multiplication tables, point group determination, determination of reducible and irreducible representations, character tables, construction of character tables for C_{2v}, C_{3v} (non-abelian group), use of symmetry in obtaining symmetry of orbitals in molecules, use of character table to determine which metal orbitals are used in σ and π bond formation in octahedral, tetrahedral and square planar transition metal complexes, qualitative splitting of s, p, d, f orbitals in octahedral, tetrahedral and square planar fields using character tables and without the use of character Tables.

UNIT-II

Molecular Orbital Theory for Metal Complexes:

Recapitulations, ligands symmetry orbitals and metal orbitals involved in molecular orbitals formation in octahedral complexes, MOEL diagrams for octahedral tetrahedral and square planar complexes showing σ and π bonding in transition metal complexes.

InterelectronicRepulsions:

Spin-spin, orbital-orbital and spin orbital coupling, LS and jj coupling schemes, determination of all the spectroscopic terms of p^n, d^n ions, determination of the ground state terms for p^n, d^n, f^n ions using L.S. scheme, determination of total degeneracy of terms, order of interelectronic repulsions and crystal field strength in various fields, two type of electron repulsion parameters, spin orbit coupling parameters (λ) energy separation between different j states, The effect of octahedral and tetrahedral fields on S, P, D and F terms (with help of the character table), splitting patterns of and G, H and I terms

UNIT-III

Free Ions in Medium and Strong Crystal Fields:

Strong field configurations, transition from weak to strong crystal fields, evaluation of strong crystal field terms of d^2 configuration in octahedral and tetrahedral crystal fields (using group theory), construction of the correlation energy level diagrams of d^2 configuration in octrahedral field, study of energy level diagrams for higher configurations, selection rules of electronic transitions in transition metal complexes, their proof using group theory, relaxation of the selection rule in centrosymmetric and non-centrosymmetric molecules, Orgel diagrams, Tanabe Sugano diagrams

Magnetic Properties:

Van Vlecks formula for susceptibility, first order Zeeman effect, second order Zeeman effect, KT states, quenching of orbitals angular momentum by ligand field, the magnetic properties of A and E terms, the magnetic properties of T terms, electronic delocalization, magnetic properties of d^n and f^n metal ions**.**

UNIT-IV

Electronic Spectra of Transition Metal Complexes:

Variation of the Racah parameter, nephlauxetic effect -central field covalency, symmetry restricted covalency, differential radial expansion, spectrochemical series, band intensities, factors influencing band widths, discussion of electronic spectra of octahedral and tetrahedral d^1 – d^9 metal ions, calculation of 10Dq and B with use of Orgel and Tanabe Sugano diagrams, low spin complexes of Mn^{3+}, Mn^{2+}, Fe^{3+}, Co^{3+}, Fe^{2+}, comment on the spectra of second and third transition series, spectra of K_3MoCl_6 and $[Rh(NH_3)_6]^{3+}$, spectra of cis and trans$[Co(en)_2X_2]^+$, $[Mn(H_2O)_6]^{2+}$, $CuSO_4.5H_2O$ and its anhydrous complex, comparison of d–d band with f–f bands. Introduction to Charge Transfer Spectra**.**

Books Recommended:

1. F.A. Cotton, Chemical Application of Group Theory, WileyEastern.
2. G. L. Miessler, D. A. Tarr, Inorganic Chemistry, 3rd edition, PearsonEducation.
3. B.N. Figgis, Introduction to Ligand Field, Wiley Eastern.
4. A.B.P. Lever, Inorganic Electronic Spectroscopy,Elsevier.
5. A. Earnshaw, Introduction to Magnetochemistry, Academic Press.
6. J.E. Huheey, Inorganic Chemistry Principles of Structure and Reactivity,Harper Interscience.
7. R.S. Drago, Physical Method in Chemistry, W.B. SaundersCompany.
8. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, WileyInter-science.

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHL-1082
COURSE TITLE: Organic Reaction Mechanism- I

Course outcomes:

Students will be able to

CO1: understand the concept and various types of aromaticity and acquire the skills for correct stereochemical assignment and interpretation in simple organic molecules.

CO2: basics of reaction mechanism and understand the various types of aliphatic nucleophilic substitution reaction and their mechanism

CO3: understand the various types of aliphatic nucleophilic substitution reaction and discuss their mechanism and predict the product of the reactions

CO4: understand the various types of aromatic electrophic and nucleophilic substitution reaction and their mechanism alongwith identification and application of various rearrangemet reactions

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHL-1082
COURSE TITLE: Organic Reaction Mechanism- I

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Nature of Bonding in Organic Reactions:
Aromaticity in Benzenoid and non-benzenoid compounds. Huckel's Rule, Alternant and non-alternant hydrocarbons. Energy levels of π(pi) molecular orbitals in simple systems. Annulenes, Antiaromaticity, Homoaromaticity, PMO approach.

Stereochemistry:
Elements of symmetry, chirality, molecules with more than one chiral center.Threo and erythro isomers, methods of resolution, optical purity.Prochirality – enantiotopic and diastereotopic atoms, groups and faces. Stereospecific and stereoselective synthesis.Asymmetric synthesis.Optical activity in absence of chiral carbon (Biphenyls, Allenes, Spiranes).Chirality due to helical shape.

UNIT-II

Reaction Mechanism, Structure andReactivity:
Types of mechanisms, types of reactions, thermodynamic and kinetic requirements, Kinetic and thermodynamic control in product formation. Transition states and reaction intermediates, Isotope effects, Hard and Soft Acid Base concept, Study of reactive intermediates – Types of intermediates, isolation and detection of intermediates (including use of spectral techniques), trapping ofintermediates.

Aliphatic Nucleophilic Substitution –A:
The SN^2, $SN^1$and SNi mechanisms, mixed $SN^1$and SN^2 mechanism SET mechanism. The neighboring group mechanism (anchimeric assistance).Neighboring group participation by pi and sigma bonds.

UNIT-III

Aliphatic Nucleophilic Substitution – B:
Classical, non-classical andphenonium cations, Rearrangements in carbocations (general survey).Ester hydrolysis.Nucleophilic substitution at allylic, aliphatic trigonal and vinylic carbon.Effect on the reactivity due to – substrate structure, attacking nucleophile, leaving group and reaction medium.Ambident nucleophiles and substrates, regioselectivity. Meyer's synthesis of aldehydes, ketones, acids and esters.Alkylation by organoboranes.

Aliphatic Electrophilic Substituion:
Bimolecular mechanism – SE2 and SEi. The SE1 mechanism, Hydrogen exchange, electrophilic substitution accompanied by double bond shifts, diazo-transfer reaction, formation of sulphur ylides, effect of substrates, leaving group and solvent polarity on the reactivity.

UNIT-IV

Aromatic Electrophilic Substitution:
The arenium ion mechanism, orientation and reactivity in mono substituted and di substituted aromatics. Energy profile diagrams. The ortho/para ratio, ipso attack, orientation in other ring systems. Quantitative treatment of reactivity in substrates and electrophiles. Diazo coupling, Vilsmeir reaction, Gattermann-Koch reaction, Pechmann reaction, Houben – Hoesch reaction, Fries rearangement.

Aromatic Nucleophilic Substitution:
SNAr, SN^1, benzyne and SRN^1 mechanisms. Reactivity effect of substrate structure, leaving group and nucleophile. The von Richter, Sommelet-Hauser, and Smiles rearrangements.

Books Recommended:

1. Stereochemistry -Eliel
2. Advanced Organic Chemistry – JerryMarch.
3. Advanced Organic Chemistry, F. A. Carey, R. J. Sundberg, Volume I andII
4. Highlights of Organic Chemistry, W.J. L. Nobel; An Advanced TextBook.
5. Stereochemistry conformation and Mechanism – P. S.Kalsi

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHL-1083
COURSE TITLE: Physical Chemistry – Thermodynamics

Course outcomes:

Students will be able to

CO1: calculate change in thermodynamic properties, equilibrium constants, partial molar quantities, chemical potential.

CO2: apply phase rule and, draw phase diagrams for one, and two component systems, identify the dependency of temperature and pressure on phase transitions, and identify first/second order phase transitions, solve problems based on Debye-Huckel limiting law, calculate excess thermodynamic properties.

CO3: predict heat capacity (C_v, C_p) of an ideal gas of linear and non-linear molecules from the number of degrees of freedom, rotational and vibrational wave numbers, explain T^3 dependence of heat capacity of solids at low temperatures (universal feature) using Debye and Einstein theory of heat capacity of solids.

CO4: understand non-equilibrium states, apply Onsager's reciprocity relations and irreversible thermodynamics for biological systems.

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHL-1083
COURSE TITLE: Physical Chemistry –Thermodynamics

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**
Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Classical Thermodynamics
Brief resume of concepts of thermodynamics, free energy, chemical potential and entropy. Partial molar properties, partial molar free energy, partial molar volume and partial molar heat content and their significances. Determination of these quantities. Concept of fugacity and determination of fugacity.

UNIT-II

Non-ideal systems
Excess functions for non-ideal solutions. Activity, activity coefficients, Debye-Huckel theory for activity coefficient of electrolytic solutions, determination of activity and activity coefficients, ionic strength. Application of phase rule to three component system, second order phase transitions.

Statistical Thermodynamics:
Concept of distribution law, thermodynamic probability and most probable distribution, Ensemble averaging, postulates of ensemble averaging. Canonical, grand canonical and micro canonical ensembles, corresponding distribution laws (using Lagrange's method of undetermined multipliers).

UNIT-III

Partition functions

Translational, rotational, vibrational and electronic partition function, calculation of thermodynamic properties in terms of partition functions. Application of partition functions.
Heat capacity behavior of solids-chemical equilibria and equilibrium constants in terms of partition functions, Fermi-Dirac statistics, distribution laws, and application to metals. Bose-Einstein statistics- distribution law and application to helium.

UNIT-IV

Non Equilibrium Thermodynamics:

Thermodynamic criteria for non-equilibrium states, entropy production and entropy flow, entropy balance equations for different irreversible processes (e.g., heat flow, chemical reaction etc.) transformations of generalized fluxes and forces, non-equilibrium stationery states, phenomenological equations, microscopic reversibility and Onsager's reciprocity relations, electro kinetic phenomena, diffusion, electric conduction, irreversible thermodynamics for biological systems, coupled reactions.

Books Recommended:

1. I F Nash: Elements of classical and statistical thermodynamics
2. Lee Bot: Irreversible thermodynamics
3. Thermodynamics of Biological Processes, D. Jou and J.E. LeeBot
4. I Prigogine: Introduction to thermodynamics of irreversible processes
5. T L Hill: Introduction to statistical thermodynamics.

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHL-1084
COURSE TITLE: SPECTROSCOPY – A: Techniques for Structure Elucidation of Organic Compounds

Course outcomes:

Students will be able to

CO1: know about the Nuclear magnetic resonance spectroscopy. Proton chemical shift, spin-spin coupling, coupling constants and its applications to determine organic structures

CO2: to understand different cleavage patterns of organic compounds in Mass spectrometry and apply the knowledge for interpretation of the spectrum of an unknown compound and the principle and applications of ultraviolet and apply Woodward Fisher Rule to calculate λ_{max}

CO3: understand the concepts of Vibrational spectroscopy, Vibrational coupling overtones and Fermi resonance and its application in Organic Chemistry

CO4: apply NMR, IR, MS, UV-Vis spectroscopic techniques in solving structure of organic molecules and in determination of their stereochemistry.

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHL-1084
COURSE TITLE: SPECTROSCOPY – A: Techniques for Structure Elucidation of Organic Compounds

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Nuclear Magnetic Resonance

The Nuclear spin, Larmor frequency, the NMR isotopes, population of nuclear spin level, spin and spin lattice relaxation. Measurement techniques (CW and FT method), solvent used. Chemical shift, reference compounds, shielding constant, range of typical chemical Shifts simple application of chemical shifts, ring current and aromaticity.Shifts for ^{1}H. - Spin-spin interactions. Effect of chemical exchange, fluxional molecules, Hindered rotation on NMR spectrum Karplus relationship, nuclear magnetic double resonance, chemically induced dynamic nuclear polarization, Application of structure elucidation of simple organic molecules Lanthanide shift.

UNIT-II

Mass Spectroscopy

Elementary theory - Measurement techniques (EI, CI, FD, FAB), Resolution, Molecular ions, isotope ions, fragment ions of odd and even electron types, rearrangement ions, Factors affecting cleavage patterns, simple cleavage, cleavages at a hetero atom, multicentre fragmentations rearrangements, Reteroiels – Alder fragmentation. Cleavage associated with common functional groups (Aldehydes, ketones cyclic and acyclic esters, alcohols, olefins, aromatic compounds amines). Interpretation of the spectrum of an unknown.

Ultraviolet and VisibleSpectroscopy

The energy of electronic excitation, measurement techniques, Beer-Lambert Law, Molar extinction coefficient.The Frank Condon Principle. Different types of transition noticed in UV spectrum of organic functional groups and their relative energies. Chromophore, auxochromes, factors affecting max, Effect of steric hindrance to coplanarity, Solvent Effects. Applications of U.V. spectroscopy.

UNIT-III

Infrared Spectroscopy

Vibrational Energy Levels, Selection Rules, Force Constant, Fundamental Vibration Frequencies, Factors influencing Vibrational Frequencies (Vibrational Coupling, Hydrogen Bonding, Electronic effect, Bond Angles, Field Effect). Sampling Techniques, Absorption of Common functional Groups, Interpretation, Finger print Regions.

Applications in Organic Chemistry

(a) Determining purity and quantitative analysis.
(b) Studying reaction kinetics.
(c) Determining purity and quantitative analysis.
(d) Studying hydrogen bonding.
(e) Studying molecular geometry and conformational analysis.
(f) Studying reactive species

UNIT-IV

1. **Solution of Structural Problems by Combined Use of the following Spectroscopic Techniques:**

(a) Electronic spectra
(b) Vibrational spectroscopy
(c) NMR (^1H) spectroscopy
(d) Mass Spectroscopy

Books Recommended:

1. W. Kemp. OrganicSpectroscopy.
2. W. Kemp. N.M.R.Spectroscopy.
3. D.H. Williams and I. Fleming. Spectroscopic Methods in OrganicChemistry.
4. R.M. Silverstein and G.C. Bassler, Spectrometric Identification of OrganicCompounds.
5. Introduction to Spectroscopy –Pavia

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHM-1135
COURSE TITLE: Computer for Chemists

Course outcomes:

The students will be able to:

CO1: Comprehend various programming constructs like variables, data-types, operators, etc of C programming language.
CO2: Apply various control statements of C Programming Language for designing solutions to different real world problems.
CO3: Comprehend signature, declaration, definition and calling of functions in C for modularization of problem.
CO4: Implement single and multidimensional arrays for representing complex data collections.

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHM-1135
COURSE TITLE: Computer for Chemists

Total Marks: 50
Exam Time: (3+3) Hrs **(Theory: 20, CA:10)**
Credit (L-T-P): 1-0-1 **Practical Marks: 20**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:
Eight questions of equal marks (four each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

1. Computer Programming in C language

UNIT-I

Introduction to programming, Data Types, assignment statement, arithmetic operators, algorithms and flowcharts.Elementary programming, a typical C program, printf function. Introduction of declarations, assignments and variables: concept of an integer, concept of a variable, rules for naming variables, assignment statement, arithmetic operators.

Integer arithmetic expressions, relative priority of arithmetic operators, use of parenthesis, modulus operator.

UNIT-II

Input/Output Fuctions , Decision making in C, scanf function, relational operators, logical operators, if statement, if else statement, nesting of if statement.

UNIT-III

The while loop, do while loop, for loop, nesting of for loop.
Type char and ASCII code, character strings and how to print them, octal and hexadecimal notation.
User defined functions, returning value from a function, functions with more than one parameters.

UNIT-IV

Arrays, declaring an array, initializing an array, break statement, strings and character arrays, sorting an array, finding maximum and minimum in an array, multidimensional arrays.
Input and output.

2. Computer programs in Chemistry

(These are also be done in the practical class):

Development of small computer codes involving simple formulae in chemistry:

UNIT-I

1. Calculation of mean, median,mode.
2. Solution of a quadratic equation.
3. Calculation of linear regression.
4. Calculation of curve linear regression.

UNIT-II

5. Calculation of Bohr orbit from de Broglie Lambda for electron.
6. Calculation of wave number and frequency from value of wavelength.
7. Calculation of van der Waals radii.
8. Radioactive decay.
9. Rate constant of a 1st order reaction, 2nd order reaction.
10. Calculation of lattice energy using Born Lande equation.

UNIT-III

11. Addition, multiplication and solution of inverse of 3 X 3matrix.
12. Calculation of average molecular weight of a polymer containing n1 molecules of molecular weight m1, n2 molecules of molecular weight m2 and soon.
13. Program for calculation of molecular weight of organic compound containing C, H, N, O and S.
14. Calculation of reduced mass of diatomic molecule.
15. Calculate the RMS and most probable velocity of a gas.

UNIT-IV

16. Calculate the ionic mobility from ionic conductance values.
17. Determine the thermodynamic parameters for isothermal expansion of monoatomic ideal gas.
18. Calculation of value of g- factor from value of J and S.
19. Calculate the bond length and bond angles using crystal structure data.

Books Recommended:

1. K.V. Raman, Computers in Chemistry, Tata McGraw Hill, 1993.
2. Henry Mullish, Herbert L. Cooper, The Spirit of C: An Introduction to Modern Programming, Jaico Publications, 1987.
3. Anshuman Sharma, Learn Programming in C, Lakhanpal Publishers,7th Edition.
4. E Balagurusamy, Programming in ANSI C, Tata McGraw-Hill, 2002.
5. YashvantKanetkar, Let Us C, BPB Publications, 2016.
6. Byron Gottfried, Schaum's Outline Programming with C, McGraw Hill, 1996.

Note: The latest editions of the books should be followed

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHP-1086
COURSE TITLE: INORGANIC CHEMISTY (PRACTICAL)
(Quantitative Analysis)

Course outcomes:

Students will be able to

CO1: Experimental observation of Inorganic Quantitative Analysis

CO2: determine the strength of ions by Oxidation reduction titrations

CO3: estimate the amount of ions by precipitation titrations

CO4: estimate the amount of ions by complexometric and gravimetric methods

Master of Science (Chemistry)
(Semester-I)
Session: 2024-25
COURSE CODE: MCHP-1086
COURSE TITLE: INORGANIC CHEMISTY (PRACTICAL)
(Quantitative Analysis)

Exam Time: 6 Hrs **Max. Marks: 75**

Credit (L-T-P): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

I. Oxidation-ReductionTitrations

1. Standardization with sodium oxalate of $KMnO_4$ and determination of Ca^{2+}ion.
2. Standardization of ceric sulphate with Mohr's salt and determination of NO_3^{-1} and $C_2O_4^{-2}$ ions.
3. Standardization of $K_2Cr_2O_7$ with Fe^{2+} and determination of Fe^{3+} (Ferricalum)
4. Standardization of hypo solution with potassium iodate / $K_2Cr_2O_7$ and determination of available Cl_2 in bleaching powder, Sb^{3+} andCu^{2+}.
5. Determination of hydrazine with KIO_3titration.

II. Precipitation Titrations

1. $AgNO_3$ standardization by Mohr's method by using adsorptionindicator.
2. Volhard's method for Cl^-determination.
3. Determination of ammonium / potassiumthiocyanate.

III. ComplexometricTitrations

1. Determination of Mg^{2+} and Mn^{2+} in a mixture using fluoride ion as a demaskingagent.
2. Determination of Ni^{2+} (backtitration).
3. Determination of Ca^{2+} (by substitutionmethod).

IV. GravimetricAnalysis

1. Determination of Ba^{2+} as its chromate.
2. Estimation of lead as its leadmolybdate.
3. Estimation of chromium (III) as its leadchromate.
4. Estimation of Cu^{2+} using Ammonium/Sodiumthiocyanate.

Books Recommended:

Vogel's book on Inorganic Quantitative Analysis

Master of Science (Chemistry)
(Semester I)
Session: 2024-25
COURSE CODE: MCHP-1087
COURSE TITLE: ORGANIC CHEMISTRY (PRACTICAL)

Course outcomes:

The students will be able to

CO1: independently perform two step organic synthesis.

CO2: identify the synthesized compounds by TLC

CO3: perform analysis of common analgesic drugs by TLC

CO4: extract, identify and characterize the compounds isolated from naturalproducts

Master of Science (Chemistry)
(Semester I)
Session: 2024-25
COURSE CODE: MCHP-1087
COURSE TITLE: ORGANIC CHEMISTRY
(PRACTICAL)

Exam Time: 6Hrs **Max. Marks: 75**
Credit (L-T-P): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

UNIT–I

1. **Purification and Characterization of Organic Compounds**, the student is expected to carry out the experiments of purification (fractional crystallization, fractional distillation, chromatography) separation, purification and identification of the compounds of binary organic mixture (liquid-liquid, liquid-solid and solid-solid), using chemical analysis and IR and PMR spectral data. The student should also check the purity of the separated components on TLCplates.
2. To carry out the analysis of common analgesic drugs by thin layer chromatography, Acetaminophen, Aspirin, caffeine, phenacetin, salicylamide. (Learn to check purity of the given samples and completion of the chemical reactions).

UNIT–2

Organic Synthesis and Extraction of Organic Compounds from Natural Sources. The student is expected to carry out 4 to 6 organic preparations (usually involving not more than two steps), some of the illustrative experiments are listed below:-

1. *Extraction of Caffeine from tealeaves*
   (Ref. Experiment Organic Chemistry, (H. Dupont Durst, George W. Gokel, P 464 McGraw Hill Book Co., New York).
   Student would be asked to purity crude sample, check the purity on a TLC single spot and get the NMR scanned and interpret (Three methyl singlets and I methane singlet).
2. *Isolation of casein from milk* (try some typical colour reactionsproteins).
3. *Synthesis of 2-phenyllndole-Fischer Indole Synthesis*. Book 1, p.852
   Aim: To Study condensation and cyclization reactions.
4. *Synthesis of 3-nitrobenzoic from benzoic acid* (Rf. Ibid., p.245-247 and 443-448). **Aim:** To demonstrate the process of meta nitration, esterification and saponification of an ester. Make a comparative study of IR and PMR spectra of benzoic acid, methyl benzoate, methyl3-nitrobenzoate.
5. *Cannizaro's reaction of 4-chlorobenzaldehyde.*. Book 1, p760
   Aim: To demonstrate technique of isolation of two products from the reaction mixture and the procedure of intermolecular hydride transfer. Make a comparative study of IR and PMR spectra of 4 chlorobenzadehyde, 4-chlorobenzoic acid 4-chlorobenzyl alcohol.
6. *Synthesis of 1,3,5-Tribromobenzene from aniline*. **Aim:** To demonstrate: Bromination, Diazotization andReduction.

Books Recommended:

Vogel's Text book of practical organic chemistry, 5th edition.

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)
SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

Master of Science (Chemistry)
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)
Semester II

Master of Science (Chemistry) Semester II										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	**Th**	**P**	**CA**	
MCHL-2081	Organometallics Chemistry	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2082	Organic Reaction Mechanism -II	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2083	Physical Chemistry – Quantum Chemistry	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2084	Reaction Mechanisms and Metal clusters	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2085	Spectroscopy B: Techniques for Structure Elucidation of Inorganic Compounds	C	4-0-0	4-0-0	4	100	80	-	20	3
MCHL-2336 MCHL-2056	Mathematics for Chemists Biology for Chemists	C	2-0-0	2-0-0	2	50	40	-	10	3
MCHP-2087	Organic Chemistry Practical	C	0-0-6	0-0-3	3	75	-	60	15	3*2
MCHP-2088	Physical Chemistry Practical	C	0-0-6	0-0-3	3	75	-	60	15	3*2
Total					**28**	**700**				

C- Compulsory Course

Note: Mathematics for Chemists: For Medical Students
Biology for Chemists: For Non-Medical Students

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2081
COURSE TITLE: ORGANOMETALLICS CHEMISTRY

Course outcomes:

Students will be able to

CO1: demonstrate basic principles and illustrate stability of organometallic compounds.

CO2: identify the structure and bonding aspects of simple organometallic compounds

CO3: identify different types of organometallic reactions and apply the above concepts to explain different catalytic reactions

CO4: understand the role of pi acid ligands in organometallic chemistry

Master of Science (Chemistry) (Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2081
COURSE TITLE: ORGANOMETALLICSCHEMISTRY

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**
Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Organometallics

Energy polarity and reactivity of M-C bond, Stability of Main group organometallics: Methods of preparation in perspective-organolithium compounds: structure and bonding and reaction-carbolithiatic organometallics of group 2 and 12 e.g. Mg and Zn, Cd and Hg: Preparation and structure of organoaluminium compounds, Technical applications of Tris (alkyl)aluminium compounds. η^2- ligands: olefenic and acetylenic complexes, chelating olefenic ligands – synthesis and structure. η^2 – ligands: Allylic and η^4– complexes ofcyclopentadiene.

UNIT-II

Synthesis and structure. η^4 –ligands: Butadiene, cyclobutadiene, heterocyclic pentadiene (S, Se, Te). Classification, Nomenclature of cyclopentdienyl complex.MO treatment of ferrocene. η^6 – ligands: Benzene and its derivatives. Multideckersandwichcompounds.

UNIT-III

Homogeneous hydrogenation of unsaturated compounds, reversible cis-dihydrocatalysis, monohydrido compounds, asymmetrical hydrogenation, hydrosilation of unsaturated compounds, hydrocyanation of alkenes, alkane metathesis, Ziegler-Natta polymerization of ethylene and propylene, water gas shift reaction, acetic acid synthesis by carbonyls, Oxopalladation reactions. Organometallic Reagents in Organic synthesis.

Reaction at Coordinated ligands

The role of metal ions in the hydrolysis of amino acid esters, peptides, and amides Molecular orbital concept of role of metal ions participation, Modified aldol condensation, Imine formation, Template and Macrocyclic effect in detail.

UNIT-IV

p-acid ligands

pi-acceptor character of CO, O_2, N_2, NO, PH_3 molecules in terms of MOEL diagram, Metal carbonyls; structure and bonding; vibration spectra of metal carbonyls for bonding and structural elucidation, important reactions of metal carbonyls; preparation, bonding structure and important reactions of transition metal nitrosyl, dinitrogen and dioxygen complexes; tertiaryphosphine as ligand.

Books Recommended:

1. C. Elschenbroich and A. Salzer, Organometallics: A Concise Introduction, 2nd Ed., VCH 1992.
2. J.E. Huheey, Inorganic Chemistry Principles of Structure and Reactivity, Harper Interscience.
3. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, Ed. V andVI.Wiley Inter-science.
4. G. L. Miessler, D. A. Tarr, Inorganic Chemistry, 3rd edition, PearsonEducation

Master of Science (Chemistry) (Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2082
COURSE TITLE: Organic Reaction Mechanism – II

Course outcomes:

Students will be able to

CO1: understand the types, mechanism and factors affecting free radical reactions, apply the knowledge to predict the product of free radical reactions and to obtain an outline about elimination reactions and some specific examples of elimination reactions

CO2 : understand the mechanistic and stereochemical aspects of addition to Carbon – Carbon multiple bonds alongwith the reaction and mechanism of some named reactions of this type

CO3: understand the mechanism of metal hydride reduction of saturated/ unsaturated organic compounds learn its basic mechanism and to predict the mechanism of condensation reactions involving enolates and reactions involving carbon- carbon bond formation

CO4: acquire knowledge about the reagents used for oxidation and reduction of various organic compounds

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2082
COURSE TITLE: Organic Reaction Mechanism – II

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

1.Free Radical Reactions

Types of free radial reactions, free radical substitution mechanism.Mechanism at an aromatic substrate, neighbouring group assistance.Reactivity for aliphatic and aromatic substrates at a bridgehead.Reactivity in the attacking radicals.Effect of solvents on reactivity. Allylic halogenation (NBS), oxidation of aldehydes to acids, auto-oxidation, coupling of alkynes and arylation of aromatic compounds by diazonium salts. Sandmeyer reaction, Free radical rearrangement, Hunsdiecker reaction, Kolbe reaction, Hydroxylation of aromatics by Fenton's reagent.

2. Elimination Reactions

The E2, E1, E1cB mechanisms. Orientation of the double bond.Effects of substrate structure, attacking base, leaving group and medium on reactivity.Mechanism and orientation in pyrolytic eliminations.

UNIT-II

3. Addition to Carbon – Carbon MultipleBonds

Mechanistic and stereochemical aspects of addition reactions involving electrophiles, nucleophiles and free radicals, regio and chemoselectivity, orientation and reactivity.Addition to cyclopropane ring.Hydroboration, Michael reaction.Sharpless asymmetric epoxidation, Hydrogenation of double and triple bonds. Hydrogenation of aromatic rings.

4. Addition to Carbon – Hetero Multiple Bonds

Mechanism of condensation reactions involving enolates – Aldol, Kneoevenagel, Claisen, Mannich, Benzoin, Stobbe reactions, Reformatski reaction.

UNIT-III

5. Formation of Carbon-Carbon Bond

Principle, disconnections and synthons, electrophilic and nucleophilic carbon species. Base-catalyzed condensations; Perkin reaction, Stobbe condensation, Darzen condensation. Use of malonic, acetoacetic and cyanoacetic esters, Micheal addition, Use of acetylides, Acid-catalyzed condensation – self condensation of olefins, Friedal-Craft's reactions, Fries reactions, Diels-Alder reaction, 1-3 Dipolaradditions.

UNIT-IV

6. Oxidation

Introduction**.**Different oxidative processes. Hydrocarbons - alkenes, aromatic rings, saturated C-H groups (activated and unactivated). Alcohols, diols, aldehydes, ketones, ketals and carboxylic acids.Amines, hydrazines, and sulphides. Oxidations with ruthenium tetraoxide, iodobenzene diacetate and thallium(III) nitrate.

7. Reduction

Introduction**,** Different reductive processes. Hydrocarbons - alkanes, alkenes, alkynes and aromatic rings. Carbonyl compounds – aldehydes, ketones, acids and their derivatives. Epoxides.Nitro, nitroso, azo and oxime groups. Hydrogenolysis.

Books Recommended:

1. Principles of Organic Synthesis – Norman andCoxon

2. Advanced Organic Chemistry – JerryMarch.

3. Advanced Organic Chemistry, F.A. Carey, R.J.Sunberg.

4. Highlights of Organic Chemistry, W, J.L. Nobel; An Advanced TextBook.

5. Hand Book of Reagents for Organic Synthesis - Oxidizing and Reducing Reagents. S. D. Burke and R. L. Danheiser (John Wiley andSons)

6. Organic Synthetic reactions by William Carruthers

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2083
COURSE TITLE: Physical Chemistry-Quantum Chemistry

Course outcomes:

Students will be able to

CO1: have basic idea about quantum chemistry and the mathematics associated with quantum statistics including certain aspects of linear algebra, apply this knowledge to atomic structure

CO2: use mathematical techniques in linear algebra for eigen values and eigen vectors and first and second order differential equations not only in quantum chemistry but in other areas of chemistry

CO3: relate concepts that were originally introduced purely as modern atomic physics to molecular systems through harmonic oscillator, spin and rigid rotator

CO4**:** solve all the model problems in quantum mechanics for which exact analytical methods and solutions are available and will apply them to analyze the basis behind the postulatory method of quantum mechanics and which forms the foundations for advanced study of the subject.

Master of Science (Chemistry)

(Semester-II)
Session: 2024-25

COURSE CODE: MCHL-2083

COURSE TITLE: Physical Chemistry – Quantum Chemistry

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

1. Quantum Theory: Introduction and Principles:
Black body radiations, Planck's radiation law, photoelectric effect, Compton effect, De- Broglie hypothesis, the Heisenberg's uncertainty principle, Rydberg relation for explaining atomic spectrum of hydrogen. Bohr's Theory and its limitation solution of classical wave equation by separation of variables method.

UNIT-II

2. Operators and observations, normal and orthogonal functions, hermitian and UNITary operators, introduction to differentiation and integration, Eigen value equation. Hamiltonian operator, interpretation of wave function, postulates of quantum mechanics.

UNIT-III

3. Applications of Quantum Postulates
Solution of particle in one and three dimensional box, degeneracy, the linear harmonic oscillator, rigid rotators, quantization of vibrational and rotational energy levels, hydrogen and hydrogen like atoms.

4. Angular Momentum
Commutative laws, need of polar coordinates, transformation of Cartesian coordinate into polar coordinate, angular momentum of one particle system, orbital angular momentum, the ladder operator method for angular momentum, spin angular momentum and their relations

UNIT-IV

5. General Orbital Theory of Conjugated Systems

Chemical bonding, linear combination of atomic orbital, overlap integral, coulomb's integral, bond order, charge density calculations for ethylene, allyl system,butadiene system, cyclo butadiene cyclopropenylsystem.

6. The ApproximateMethods

Need for approximation methods, Perturbation and Variation methods and their application to Helium atom.

Books Suggested:

1. Physical Chemistry, A Molecular Approach by MacQuarrieandSimon.
2. Quantum Chemistry, Ira N. Levine, PrenticeHall.
3. Quantum Chemistry, H. Eyring, Kimball andWalter.
4. Quantum Chemistry,Atkin.
5. Fundamentals of Quantum Chemistry, Anantharaman.R.

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Master of Science (Chemistry)

(Semester-II)

Session: 2024-25

COURSE CODE: MCHL-2084

COURSE TITLE: REACTION MECHANISMS AND METAL CLUSTERS

Course outcomes:

Students will be able to

CO1:learn the mechanism of substitution reaction and explain the parameters that affects the crystal structure of a compound

CO2: learn the application of electron transfer reactions in chemical kinetics

CO2:describe the stability of metal complexes by the use of formation constants

And calculate thermodynamic parameters from them

CO4:understand the chemistry of inorganic rings , chains and metal clusters

Master of Science (Chemistry)

(Semester-II)
Session: 2024-25

COURSE CODE: MCHL-2084

COURSE TITLE: REACTION MECHANISMS AND METAL CLUSTERS

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Reaction Mechanism of Transition Metal Complexes

Inert and labile complexes, mechanisms of substitution (dissociative, associative interchange mechanism, the conjugate mechanism, substitution in *trans* complexes, substitution in *cis* complexes, isomerism of chelate rings), *trans* effect, explanation for *trans* effect, Ligand replacement reactions of square planar and octahedral complexes: their factors and mechanism of substitution, orbital occupation mechanisms. Anation reaction, Metal carbonyl reactions species with 17 electrons.

UNIT-II

Electron transfer processes with mechanism, key ideas concerning electron transfer reactions between transition Metals. Cross reactions and thermodynamics. Marcus theory, its kinetics and applications.

UNIT-III

Doubly bridged inner sphere transfer and other electron transfer reactions. Two electron transfer, non-complementary reactions. Stereochemical nonrigidity of coordinate and orgonometallic compounds, trigonal bypyramid, system with six or more coordination number. Isomerization and recemization of trischelates, metal carbonylscrambling.

Metal-ligand Equilibria in Solution

Stepwise and overall formation constant and their interaction, trends in step wise constant, factors affecting the stability of metal complex with reference to the nature of metal ion and ligand chelate effect and its thermodynamic origin. Determination of binary formation constants by pH-meter, Job's method and spectrophotometry.

UNIT-IV

Inorganic Rings, Chains and Metal Cluster

Borazines, Phosphazenes and other heterocyclic inorganic ring, systems, homocyclic inorganic systems, cages of P and S, oxides andsulphides, Higher boranes and carboranes, methods of classifying boranes, Molecular orbit view of chlorohydroborane ions and carboranesmetallocarboranes, isopoly and heteropoly acids and salts; metal-metal bonds and bi-, tri-, tetra-, penta-, and hexanuclear clusters, electron counting schemes for HNCC's. Approaches to systematic cluster synthesis; mention of seven, eight and nine atom clusters. Isolobal analogy and examples of application of analogy.

Books Recommended:

1. K.P. Purcell and J. V. Kotz: Inorganic Chemistry W.B. Saunders Co. London,(1977).

2. G. L. Miessler, D. A. Tarr, Inorganic Chemistry, 3rd edition, PearsonEducation.

3. F.A. Cotton and Wilkinson: Inorganic Chemistry V and VI Ed. Willy Eastern –(1999).

4. J.E. Huheey: Inorganic Chemistry III and IV Ed. Pearson Education Asia –(2002).

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2085
COURSE TITLE: SPECTROSCOPY – B: Techniques for Structure Elucidation of Inorganic Compounds

Course outcomes:

Students will be able to

CO1: identify symmetry elements and symmetry operations

CO2: determine the rotational spectra of linear molecules

CO3: determine IR and Raman activity of linear molecules

CO4: understand the principle and spectra interpretation of photoelectron spectroscopy, electron spin resonance spectroscopy, nuclear quadrupole resonance spectroscopy, Mossbauer spectroscopy

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2085
COURSE TITLE: SPECTROSCOPY – B: Techniques for Structure Elucidation of Inorganic Compounds

Exam Time: 3Hrs **Max. Marks: 100**
Credit (L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setters:

Eight questions of equal marks (sixteen each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from UNITs I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT – I

Vibration and Rotation Spectroscopy: Infrared, Raman and Microwave

Harmonic and Anharmonic oscillators, vibrational energies of diatomic molecules. Potential energy function for a chemical bond. Absorption of radiations by molecular vibration. Selection rules, force constant. Rotational energies of linear molecules. Rotational energy level populations, merits and demerits of microwave spectroscopy, rotational spectra of rigid, linear molecules, non-rigid rotators. Determination of moment of inertia and bond length from rotational spectra, relative intensities of spectral lines. Rotational spectra of non-linear molecules (brief mention), vibrations in polyatomic molecules. Effects giving rise to absorption bonds. Group vibrations and limitations of group vibration concepts.

UNIT – II

Vibration and Rotation Spectroscopy: Infrared, Raman and Microwave

- Polarisations of light. Theories of Raman Effect, Merits and demerits of Raman spectroscopy. Pure rotational Raman spectra of linear molecules. Vibrational Raman spectra selection rules. Rule of mutual exclusion. Rotational Fine IR spectra, vibronic coupling.
- Sample handling. Factors affecting absorption frequencies. Interpretation and finger printing
- regions.

UNIT-III

Photo Electron Spectroscopy

Introduction, excitation and ejection of electrons, electronic energy levels in atoms and molecules, Core level photoelectron spectroscopy, symmetry and molecular orbitals, valence electron photo electron spectroscopy, valence excitation spectroscopy. Dissociation, Predissociation, change of shape on excitation.

Electron Spin Resonance Spectroscopy

Features of ESR spectra, measurement technique hyperfine coupling in isotropic system (C_5H_5, C_6H_6, $C_{14}H_{10}$, biphenyl) Anisotropic splitting, Electron – electron interaction, Transition metal complexes g-value and factors affecting g-value, zerofield splitting, Kramer's degeneracy, Rate of electron exchange, Application to p – benzoseniquinone DPPH, pyrazine. Double resonance technique ENDOR, ELDOR.

UNIT – IV

Nuclear Quadrupole Resonance Spectroscopy

Introduction, effects of magnetic field on the spectra. Relationship between the electric field gradient and molecular structure. Interpretation of eQ, data, the effect of crystal lattiee on the magnitude of eQ4, double resonance technique, Application ($PFCI_4.PCI_5$), $(NH_4)_2TeCl_6$,

Mossbauer Spectroscopy

Introduction, principles, conditions of MB spectra, parameters from MB spectra. Isomer shift electric quadrupole interaction, magnetic interaction, use of additive partial quadrupole splittings to predict quadrupole coupling.

Books Recommended:

1. E.A.V Ebsworth; W.H Renkin; Cradock, Structure Methods in InorganicChemistry.
2. R.S Drago, Physical Methods for Chemists (Ist and IInd Edition).
3. C.N Banwell, Fundamentals of MolecularSpectroscopy.
4. S. Walker and H. Straugh an Spectroscopy,Vol.I.
5. J.E. Wertz and J.R. Bolton, Electron Spin Resonance (p.49-65).
6. N.N. Greenwood and T.C Tibb, Mossbauer Spectroscopy.
7. K. Nakamoto, Infrared Spectra of Inorganic and co-ordination Compounds.

Master of Science (Chemistry) Semester-II
Session 2024-25
Course Title: Mathematics for Chemists
Course Code-MCHL-2336

Course outcomes:

Students will be able to

CO 1: Understand the trigonometric functions with the help of unit circle and application of trigonometric identities and able to solve determinants with the help of its various properties.

CO 2: Demonstrate the concept of matrices and type of matrices and how to calculate transpose, adjoint and inverse of matrices. Manage to solve problems related to addition, subtraction and multiplication.To understand the concept and solve system of linear equations.

CO 3: Solve Complex problems related to derivative of sum, difference, product and quotient of functions and also to find derivative of trigonometric functions, inverse trigonometric functions, logarithmic functions and exponential functions.

CO 4: Recognize integration as an inverse of differentiation and to calculate area under curve and understand integrals as limit of sum and its geometrical interpretation.

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2336
COURSE TITLE: MATHEMATICS FOR CHEMISTS
(For Medical Students)

Exam Time: 3 Hrs **Max. Marks: 50**

Credit (L-T-P): 2-0-0 **(Theory: 40, CA: 10)**

Instructions for the Paper Setters:
Eight questions of equal marks (eight each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Trigonometry and Determinants:
Definition of sin, cos, tan, cot, sec, cosec functions with the help of unit circle, values of sin x, cos x for x = 0, π/6, π /3, π /2. Trigonometric identities (without proofs) and their applications. Definition and expansion properties of determinants, product of two determinants of 3rd order.

Unit-II

Matrices:
Introduction to various forms of Matrices, row, column, diagonal unit, Submatrix, square, equal matrices, null, symmetric and skew symmetric matrices, transpose of a matrix, adjoint and inverse of matrices. Addition, multiplication, characteristic equation of a matrix, statement of Cayley Hamilton theorem. Rank of matrix, condition of consistency of a system of linear equations. Eigen vectors and Eigen values of matrices.

Unit-III

Differential Calculus
Differentiation of standard functions, theorems relating to the sum, difference, product and quotient of functions (without proofs), derivative of trigonometric functions, inverse trigonometric functions, logarithmic functions and exponential functions, differentiation of implict functions, logarithmic differentiation

Unit-IV

Integral Calculus
Integration as an inverse of differentiation, area under a curve, indefinite integrals of standard forms, method of substitution, method of partial fractions, integration by parts, definite integrals,definite integrals as limit of a sumand geometrical interpretation.

Reference Books:
1. Mathematics Textbook for class XI, NCERT
2 Mathematics Textbook for class XII, NCERT
3. J. B. Dence, Mathematical Techniques in Chemistry, John Wiley & Sons, First edition, 1975.

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2056
COURSE TITLE: BIOLOGY FOR CHEMISTS
(For Non-Medical Students)

Course outcomes:

Students will be able to

CO1: Gain knowledge about the biomolecules and cell structure.

CO2: Understand different types of tissues.

CO3: Understand Mendelian laws, structure of DNA and gene expression.

CO4: Understand Whittaker's system of classification and structure of virus.

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHL-2056
COURSE TITLE: BIOLOGY FOR CHEMISTS
(For Non-Medical Students)

Exam Time: 3 Hrs **Max. Marks: 50**

Credit (L-T-P): 2-0-0 **(Theory: 40, CA: 10)**

Note: The students are allowed to use Non-Programmable Calculator.

Instructions for the Paper Setter

Eight questions of equal marks (eight each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from unit I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

The Organization of Life

Biologically important molecules: Carbohydrates, lipids, proteins and nucleic acids.
The life of cells – The cell theory, general characteristics of cells, difference between prokaryotic and eukaryotic cells, difference between plant and animal cells, cell organelles.

UNIT-II

Tissues, organs and organ systems: Animal tissues; epithelial tissues, connective tissues, muscle tissue, nervous tissue and neoplasias; plant tissue: meristematic tissue, permanent tissues.

UNIT-III

Genetics

The basic principle of heredity: Mendals law, monohybrid cross, dihybrid cross.
DNA – Double helix structure and replication.
Genes expression: Transcription and translation, genetic code.

UNIT-IV

The Diversity of Life

The classification of Living things – Criteria of classification, Whittaker's systems of classification, and their characteristics with are example of each.
Viruses, structure of Viruses.

Book Recommended:

1. Cord Biology - South Western Educational Publications, Texas, 200

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHP-2087
COURSE TITLE: ORGANIC CHEMISTRY (PRACTICAL)

Course outcomes:

The students will be able to

CO1: understand and perform multi step organic synthesis.

CO2: CO2: characterize organic molecules by physical and spectroscopic methods like M.P, B.P, and IR

CO3: design multistep synthesis

CO4: expertise the various techniques of analysis of organic substances

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHP-2087
COURSE TITLE: ORGANIC CHEMISTRY (PRACTICAL)

Exam Time: 6 Hrs **Max. Marks: 75**
Credit (L-T-P): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners.Two copies of the same should be submitted for the record to COE Office,Kanya Maha Vidyalaya, Jalandhar

Multistep Organic Synthesis

1. Synthesis of 2-chloro-4-bromoaniline from aniline (Bromination and chlorination) Book 1, page292.
2. Synthesis of methyl orange from aniline.
   (Aromatic electrophilic substitution and diazocoupling).Book 2, page 250.
3. Synthesis of benzpinacol and its pinacolrearrangement.
4. Synthesis of o-chlorobenzoic acid from phthalimide. Synthesis of acridone from o-chlorobenzoic acid. (Hofmann bromamide and Sandmeyer'sreaction).
5. Synthesis of 2,4-dinitrophenyl hydrazine from chloro benzene. (Electrophilic and nucleophilic substitution reactions on aromatic ring).
6. Synthesis of triphenylcarbinol from bromobenzene. (Grignard reaction) Book 2, page220.

B: Quantitative Analysis of Organic Compounds:

1. Estimation of phenol/aniline using bromate-bromide solution.
   (The application to find the purity of the sample and to determine the amount in given solution).
2. Determine the number of hydroxyl and amino groups in the given sample by the acetylation method.
3. Determine the mol. wt. of the given ketone by using 2,4-DNP method.
4. Estimation of reducing sugar by Fehling solutionmethod.
5. To determine the saponification value of the given fat or oilsample.
6. To determine the iodine number of the given fat or oilsample.

Books Recommended:

1. An Introduction to Modern Experimental Organic Chemistry, R. M. Roberts, J. C. Gilbert, L.B.Rodewald and A. S. Wingrove Holt, Ranehart and Winston Inc. NewYork.
2. Introduction to Organic Laboratory Techniques – A Contemporary Approach. D. L.Pavia, G. M. Lampmana and G. S. Kriz, W. B. Saunders Company, 1976.
3. Laboratory Experiments in Organic Chemistry, R. Adams, J. R. Johnson and C. F. Wilcox. The Macmillan Limited,London.
4. Text Book of Practical Organic Chemistry, A. I.Vogel.

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHP-2088
COURSE TITLE: Physical Chemistry (Practical)

Course outcomes:

Students will be able to

CO1: know about the safety requirements and lab skills required to perform physico-chemical experiments

CO2: know the principle and mechanism of Conductometric and pH metric titrations experiments

CO3: study distribution of benzoic acid in organic and aqueous solvent

CO4: determine specific and molar refraction using Abbe's refractometer.

Master of Science (Chemistry)
(Semester-II)
Session: 2024-25
COURSE CODE: MCHP-2088
COURSE TITLE: Physical Chemistry (Practical)

Time: 6Hrs **Max. Marks: 75**
Credit (L-T-P): 0-0-3 **(P: 60, CA: 15)**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE Office,Kanya Maha Vidyalaya,Jalandhar.

1) To determine the strength of given acid by Ph metrically.
2) To determine dissociation constant of given acid pH metrically
3) Titration of weak acid conductometrically
4) Titration of strong acidconductometrically
5) To determine dissociation constant of given acid conductometrically
6) Determine the dissociation constant of acetic acid in DMSO, DMF, dioxane by titrating it with KOH.
7) Determine the activity coefficient of an electrolyte at different molalities by e.m.f. measurements.
8) Compare the cleansing powers of samples of two detergents from surface tension measurements.
9) Determine the specific refraction, molar refraction and atomic parachor with the helpofAbbe'srefractometer.
10) To study the distribution of benzoic acid between benzene and water.
11) Determine the equilibrium constant of reaction KI $+I_2$ à KI_3 by distribution law and hence find the value of go of the abovereaction.
12) Compare the relative strength of CH_3COOH and $ClCH_2COOH$ from conductance measurements.
13) Determine the solubility (g/litre) of sparingly soluble lead sulphate fromconductance measurements.
14) Titrate a given mixture of HCl and CH_3COOH against NaOH solution conductometrically.
15) Compare the relative strengthof:
i) HCl and ii) H_2SO_4 by following the kinetics of inversion of cane sugarPolarimetrically.

Books Recommended:

1.Yadav, J. B (2005): *Advanced Practical Physical Chemistry*, 22nd edition, Goel publishing House, Krishna Prakashan Media Ltd.

2. Venkatesan, V,Veeraswamy, R and Kulandaivelu, A.R (1997): *Basic Principles of Practical Chemistry*", 2nd edition, Sultan Chand and Sons Publication, New Delhi.

ANNEXURE E

FACULTY OF LIFE SCIENCES

SYLLABUS

of

Chemistry

for

Bachelor of Science (Biotechnology) (Semester I)

(Under Credit Based Continuous Evaluation Grading System)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Biotechnology)

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)

Bachelor of Science (Biotechnology) Semester-I										
Course Code	**Course Title**	**Course Type**	**Hours Per Week L-T-P**	**Credits L-T-P**	**Total Credits**	**Marks**				**Examination time (in Hours)**
						Total	Th	P	CA	
BBTL-1087	Chemistry-I	C	4-0-0	4-0-0	4	100	80	-	20	3
BBTP-1082	Lab in Chemistry-I	C	0-0-4	0-0-2	2	50	-	40	10	3.5

Bachelor of Science (Biotechnology)
(Semester-I)
Session: 2024-25
Course Code: BBTL-1087
COURSE TITLE: Chemistry-I
(Theory)

Course outcomes:

Students will be able to:

CO1: understand the key features of coordination compounds viz.variety of structures, oxidation numbers and electronic configurations, coordination numbers and explain the bonding and stability of complexes along with their nomenclature and structure.

CO2: understand the postulates of VBT, inner and outer orbital complexes

CO3: describe the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them, understand macrocyclic effect, crown ethers, cryptands

CO4: understand Crystal field splitting of d-orbitals in octahedral, tetrahedral, cubic and square planer fields of ligands.

Bachelor of Science (Biotechnology)
(Semester-I)
Session: 2024-25
Course Code: BBTL-1087
COURSE TITLE: Chemistry-I
(Theory)

Exam Time: 3Hrs. **Max.Marks:100**
Credit(L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Instructions for the Paper Setters:
Eight questions of equal marks (eight marks each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

Introduction, Werner's coordination theory, naming of co-ordinate complexes.

Co-ordination numbers 1-12. Factors affecting co-ordination numbers and stereo-chemistry, Isomerism in coordination compounds.

Unit-II

Valence bond theory for co-ordinate complexes, inner and outer orbital complexes, electro-neutrality and back bonding, limitations of V.B. theory.

Unit-lll

Stability of co-ordination compounds

Introduction Factors affecting the stability of metal ion complexes with general ligands

Alkali metal and alkaline earth metal chelators: Definition and few examples of macrocyclic ligands, macrocyclic effect, crown ethers and cryptands.

Unit-IV

Crystal field theory-Splitting of d-orbitals in octahedral, tetrahedral, cubic and square planer fields of ligands, calculations of C.F.S.E. in high spin and low spin octahedral and high spin tetrahedral complexes, factors affecting the 10 Dq value.

Books Recommended:
1. G.L. Eichorn, Inorganic Biochemistry, Vol. I Elsevier,
2. J.E. Huheey, E.A. Keiter, R.L. Keiter, Inorganic Chemistry, 4th ed. Pearson Education, Singapore, 1999.
3. D.F.C Shriver, P.W. Atkins and C.H. Langford, Inorganic Chemistry, ELBS Oxford, 1991.
4. Cowan, J.A. (1997) – Inorganic Biochemistry – An Introduction, Wiley- VCH

Bachelor of Science (Biotechnology)
(Semester-I)
Session: 2024-25
Course Code: BBTP-1082
COURSE TITLE: Lab in Chemistry-I
(Practical)

Course outcomes:

Students will be able to:

CO1: understand the technique of volumetric analysis

CO2: understand Iodimetry, Iodometry

CO3: understand Redox titrations using $K_2Cr_2O_7$ and $KMnO_4$.

CO4: identify the various ions present in the mixture.

Bachelor of Science (Biotechnology)
(Semester-I)
Session: 2024-25
Course Code: BBTP-1082
COURSE TITLE: Lab in Chemistry-I
(Practical)

Exam Time: 3.5 Hrs **Max. Marks: 50**

Credit (L-T-P): 0-0-2 **(Practical: 40, CA: 10)**

Insructions for the practical Examiner: Question paper is to be set on the spot jointly by the internal and external examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

Experiments

Volumetric Analysis:

Iodimetry, Iodometry, Redox titrations using $K_2Cr_2O_7$ and $KMnO_4$.

Inorganic qualitative analysis:

Four ions (Two cations two anions).

A. Preliminary tests: Physical examination, Dry heating test, charcoal cavity test, $Co(NO_3)_2$ test, flame test, borax bead test.

B. Acid radical analysis:

Dil. H_2SO_4 group: CO^{2-}_3, NO^-_2, S^{2-}, SO_3^{2-}

Conc, H_2SO_4 group: Cl^-, Br^-, I^-, NO_3^-, CH_3COO^-

Individual group: SO_4^{2-}, PO_4^{3-}, BO_3^{3-}

C. Basic radical analysis:

NH_4^+ Pb^{2+}, Cu^{2+}, Cd^{2+}, Fe^{2+} or Fe^{3+}, Al^{3+}, Co^{2+}, Ni^{2+}, Mn^{2+}, Zn^{2+}, Ba^{2+}, Sr^{2+}, Ca^{2+} Mg^{2+}, Na^+, K^+ and their confirmation.

Book recommended:

G. Svehla, B. Sivasankar, Vogels Qualitative Inorganic Analysis 7 Edition, 2012

ANNEXURE F

FACULTY OF SCIENCES

SYLLABUS

of

Chemistry

for

Bachelor of Science

(Semester V)

(UnderContinuous Evaluation System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science

(Session: 2024-25)

Bachelor of Science (Semester V)										
Course Name	**Programme Name**	**Course Code**		**Course Type**	**Marks**					**Examination time (in Hours)**
					Total	**Paper**	**Ext.**		**CA**	
							L	**P**		
Chemistry	**Bachelor of Science**	BSMM-5084	I	C	100	Chemistry (Inorganic Chemistry)	30	-	20	3
		BSNM-5084	II			Chemistry (Physical Chemistry)	30	-		3
			P			Chemistry (Practical)	-	20		3½

Bachelor of Science
(SEMESTER–V)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-5084(I)
COURSE TITLE: CHEMISTRY (INORGANIC CHEMISTRY)

Course outcomes

CO1: use Crystal Field Theory to understand the structure, hybridisation, geometry and predict the colour of the complexes.

CO2: to describe the magnetic properties of coordination compounds.

CO3: describe the stability of metal complexes by the use of formation constants and to calculate thermodynamic parameters from them.

CO4: to draw Orgel diagrams for d^1 to d^{10} systems and predict the possible transitions and to calculate number of microstate and ground state term symbols and understand preparations, properties and applications of alkyls aryls of lithium and aluminium, bonding in metal-ethylenic complexes, mechanism of homogeneous hydrogenation.

Bachelor of Science
(SEMESTER–V)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-5084(I)
COURSE TITLE: CHEMISTRY (INORGANIC CHEMISTRY)

Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

Unit-I

1.Metal-ligand Bonding in Transition Metal Complexes

Limitations of valence bond theory, an elementary idea of crystal-field theory, crystal field splitting in octahedral, tetrahedral and square planar complexes, factors affecting the crystal-field parameters.

Unit-II

2. Magnetic Properties of Transition Metal Complexes

Types of magnetic behaviour, methods of determining magnetic susceptibility, spin-only formula. L-S coupling, correlation of μ_s and μ_{eff} values, orbital contribution to magnetic moments, application of magnetic moment data for characterization of 3d-metal complexes.

3. Thermodynamic and Kinetic Aspects of Metal Complexes

A brief outline of thermodynamic stability of metal complexes and factors affecting the stability, substitution reactions of square planar complexes.

Unit-III

4. Electronic Spectra of Transition Metal Complexes

Term Symbols for $p^2$and d^2 systems, spectroscopic ground states for d^1-d^{10} electronic configurations. Types of electronic transitions, selection rules for d-d transitions, spectroscopic ground states, Orgel diagram for d^1-d^5.

Unit-IV

5. Organometallic Compounds

Definition, nomenclature and classification of organometallic compounds. EAN rule, preparation, properties, and applications of alkyls aryls of lithium and aluminium, bonding in metal-ethylenic complexes, Mechanism of homogeneous hydrogenation reactions.

Books Suggested:

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 3rd edition, Pubs: John Wiley Sons. 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman Hall Ltd., 1991.
3. Shriver, D.E., Alkins, P.W., Langford, C.H., Inorganic Chemistry; 4th edition, Oxford Publisher: Oxford University Press, 2006.
4. Porterfield, W.W., Wesley, A., Inorganic Chemistry; Pubs: Addison-Wesley Publishing Company, 1984. 5
.Miessler, G.L., Larr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson Education Inc., 2004.
6. Puri, B.R., Sharma, L.R., Kalia, K.C., Principles of Inorganic Chemistry; 30th edition, Pubs:
Milestones Publisher, 2006-07.

Bachelor of Science
(SEMESTER–V)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-5084(II)
COURSE TITLE: CHEMISTRY (PHYSICAL CHEMISTRY)

Course outcomes:

Students will be able to:
CO1: understand conductance and its types, applications of conductivity measurements, conductometric titrations, transport numbers

CO2: acquire knowledge about electrodes, reversible and irreversible cells, concentration cells, E.M.F, potentiometric titrations

CO3: understand radioactivity, laws of radioactive decay, nuclear reactions, applications of radioactivity

CO4: characterise the molecules with the help of various spectroscopic techniques such as vibrational, rotational, raman and electronic spectroscopy

Bachelor of Science
(SEMESTER–V)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-5084(II)
COURSE TITLE: CHEMISTRY (PHYSICALCHEMISTRY)

Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

Unit-I

1. Electrochemistry-I

Electrical transport-conduction in metals and in electrolyte solutions, specific conductance and equivalent conductance, measurement of equivalent conductance, variation of equivalent and specific conductance with dilution, migration of ions and Kohlrausch law, Arrhenius theory of electrolyte dissociation and its limitations, weak and strong electrolytes, Ostwald's dilution law, its uses and limitations. Debye-Huckel-Onsager's equation for strong electrolytes (elementary treatment only). Transport number, definition and determination by Hittorf method and moving boundary method. Applications of conductivity measurements: determination of degree of dissociation, determination of K_a of acids, determination of solubility product of a sparingly soluble salt, conductometric titrations.

Unit-II

2. Electrochemistry – II

Types of reversible electrodes-gas metal ion, metal ion, metal insoluble salt-anion and redox electrodes. Electrode reactions. Nernst equation, derivation of cell E.M.F. and single electrode potential, standard hydrogen electrode, reference electrodes, standard electrode potential, sign conventions, electrochemical series and its significance. Electrolytic and Galvanic cells -reversible and irreverisible cells, conventional representation of electrochemical cells.

EMF of a cell and its measurements. Computation of cell. EMF, Calculation of thermodynamic quantities of cell reactions (ΔG, ΔH and K), polarization, over potential and hydrogen overvoltage. Concentration cells with and without transport, liquid junction potential, application of concentration cells, valency of ions, solubility product and activity coefficient, potentiometric titrations.Definition of pH and pK_a, determination of pH using

hydrogen, quinhydrone and glass electrodes by potentiometric methods. Buffers-mechanism of buffer action, Henderson-Hazel equation, Hydrolysis of salts. Corrosion-types, theories and methods of combating it.

Unit-III

3. Nuclear Chemistry

Introduction: Radioactivity, Nuclear Structure, Size of Nucleus, Mass Defects and Binding Energy, Nuclear Stability, Nuclear Forces, Nuclear Spin and Moments of Nuclei, Nuclear Models, Nuclear Decay Processes, The Laws of Radioactive Decay, Soddy-Fajans Group Displacement Law, Rate of Nuclear Decay and Half Life Time (Kinetics of Radioactive Decay), Induced Nuclear Reactions, Types of Nuclear Processes, High Energy Nuclear Reactions, Nuclear Reaction Cross-Section, Artificial radioactivity, Detection and Measurement of Radioactivity, Nuclear Fission, Nuclear Fusion, Applications of Radioactivity.

Unit-IV

4. Spectroscopy

Introduction: Electromagnetic radiation, regions of the spectrum, basic features of different spectrometers, statement of the Born-Oppenheimer approximation, degrees of freedom.

5. Rotational Spectrum

Diatomic molecules. Energy levels of a rigid rotor (semiclassical principles), selection rules, spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution) determination of bond length, qualitative description of non-rigid rotor, isotope effect.

6. Vibrational Spectrum

Infrared spectrum: Energy levels of simple harmonic oscillator, selection rules, pure vibrational spectrum, intensity, determination of force constant and qualitative relation of force constant and bond energies, effect of anharmonic motion and isotope on the spectrum, idea of vibrational frequencies of different functional groups.

Raman Spectrum: Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

7. Electronic Spectrum

Concept of potential energy curves for bonding and antibonding molecular orbitals, qualitative description of selection rules and Franck-Condon principle. Qualitative description of s, p, and n M.O., their energy levels and the respective transitions.

Books Suggested: -

1. Atkins, P., Paula, J.de, Atkins Physical Chemistry; 8th edition, Pubs: Oxford University Press,
2008.
2. Puri, B.R., Sharma, L.R., Pathania, M.S., Principles of Physical Chemistry; 43rd edition, Pubs:

Vishal Publishing Co., 2008.
3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Companies Inc, 1996.
4. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
5. Albert, R.A., Silbey, R.J., Physical Chemistry; 1st edition, Pubs: John Wiley and Sons Inc., 1992.
6. Levine, I.N., Physical Chemistry; 5th edition, Pubs: Tata McGraw Hill Publishing Co. Ltd,2002.

Bachelor of Science
(SEMESTER–V)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-5084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to

CO1: synthesize and analyse the coordination compounds and to determine the end point of various conductometric titrations

CO2: know the principle and working of Abbe's Refractometer and to determine the composition of unknown mixture of two liquids by refractive index measurements.

CO3: learn the technique of Rast's methods and learn phenomenon of adsorption of acetic acid and oxalic acid on charcoal

CO4: learn distribution coefficient of of iodine between CCl_4 and water

Bachelor of Science
(SEMESTER–V)
SESSION: 2024-2025
COURSE CODE: BSMM/BSNM-5084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Duration: 3½ Hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, Kanya Maha Vidyalaya, Jalandhar.

(I) Synthesis and Analysis

(a) Preparation of Sodium trioxalatoferrate (III)
(b) Preparation of Ni-DMG Complex
(c) Preparation of Copper tetrammine complex
(d) Preparation of cis-bisoxalatodiaquachromate (III) ion

(II) Physical Chemistry
(a) Conductometric Titrations
(i) Determine the end point of the following titrations by the conductometric methods.
Strong acid-Strong base
Strong acid-Weak base
Weak acid-Strong base
Weak acid-Weak base
(ii) Determine the composition of a mixture of acetic acid and the hydrochloric acid by conductometric titration.
(b) (i) Molecular Weight Determination of acetanilide, napthalane, using camphor as solvent **(Rast's methods).**
(ii) To determine the molecular weight of a polymer by viscosity measurements.
(c) Adsorption (i)To study the adsorption of acetic acid oxalic/acid from aqueous solutions by charcoal.
(d) Phase Equilibria (i) To determine the distribution coefficient of iodine between CCl_4 and water.
(e) Refractometry
(i) Determination of refractive index of a liquid by Abbe refractometer, and hence the specific and molar refraction.
(ii) To determine the composition of unknown mixture of two liquids by refractive index measurements.

Books Suggested: -

1. Experimental Inorganic Chemistry, W.G. Palmer, Cambridge.

2. Handbook of preparative Inorganic Chemistry, Vol. I and II, Brauer, Academic Press.

3. Inorganic Synthesis, McGraw Hill.

4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press

5. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.

6. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.

7. Advanced Experimental Chemistry, Vol. I, Physical, J.N. Guru and R. Kapoor, S. Chand and Co.

8. Selected Experiments in Physical Chemistry, N.G. Mukherjee, J.N. Ghosh and Sons.

9. Experiments Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

FACULTY OF SCIENCES

SYLLABUS

of

Chemistry

For

Bachelor of Science

(Semester VI)

(Under Continuous Evaluation System)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science

(Session: 2024-25)

Bachelor of Science (Semester VI)										
Course Name	**Program Name**	**Course Code**		**Course Type**	**Marks**					**Examination time (in Hours)**
					Total	**Paper**	**Ext.**		**CA**	
							L	**P**		
Chemistry	Bachelor of Science	BSMM-6084	I	C	100	Chemistry (Molecular Spectroscopy)	30	-	20	3
			II			Chemistry (Physical Chemistry)	30	-		3
		BSNM-6084	P			Chemistry (Practical)	-	20		3½

Bachelor of Science
(SEMESTER-VI)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-6084(I)
COURSE TITLE: CHEMISTRY (Molecular Spectroscopy)

Students will be able to

CO1: understand the principle and applications of ultraviolet and apply Woodward Fisher Rule to calculate λ_{max}

CO2: understand the concepts of Vibrational spectroscopy, Vibrational coupling overtones and Fermi resonance and its application in Organic Chemistry

CO3: know about the Nuclear magnetic resonance spectroscopy. Proton chemical shift, spin-spin coupling, coupling constants and its applications to determine organic structures

CO4: to understand different cleavage patterns of organic compounds in Mass spectrometry and apply the knowledge for interpretation of the spectrum of an unknown compound.

Bachelor of Science
(SEMESTER-VI)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-6084(I)
COURSE TITLE: CHEMISTRY (Molecular Spectroscopy)

Examination Time: 3 Hrs. **Max. Marks: 30**

Instructions for the Paper Setters:

Eight questions of equal marks (six marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

UNIT –I

1. Energy and ElectromagneticSpectrum

(10 Hrs)

Introduction, electromagnetic spectrum and Units, Regions of the spectrum,Statement of Born-Oppenheimer approximation, Degree of freedom, Frank Condon Principle, Fluorescence and Phosphorescence.

II. Ultraviolet and Visible Spectroscopy

The energy of electronic excitation, Measurement techniques, Beer-Lambert Law, Molar extinction coefficient. Different types of transition noticed in UV spectrum of organic functional groups and their relative energies. Chromophore, Auxochromes, Absorption and intensity shifts, Factors affecting λ_{max} , Effect of steric hindrance to coplanarity, Solvent effects.

UNIT – II

III. Infrared Spectroscopy (10 Hrs)

Vibrational energy levels, Selection rules, Force constant, Fundamental vibration frequencies, Factors influencing Vibrational Frequencies (Vibrational Coupling, Hydrogen Bonding, Electronic effect, Bond Angles, Field Effect) of different functional groups, Sampling techniques.

IV. Applications of UV and IR Spectroscopy

Applications of UV spectroscopy, Woodward Fieser rules for calculating λ_{max} of

conjugated polyenes and α,ß -unsaturated carbonyl compounds. Applications of IR spectroscopy, Absorption of Common functional Groups, Interpretation of simple IR spectra, Finger print regions. Simple numerical problems based on UV and IR spectroscopy.

UNIT-III

V. Proton Magnetic Resonance spectroscopy (^{1}HNMR) (13 Hrs)

The Nuclear spin, Larmor frequency, the NMR isotopes, Population of nuclear spin level, Spin and Spin lattice relaxation, Measurement techniques (CW and FT method), Solvent used, Reference compounds, Chemical shift, nuclear shielding and deshielding, chemical shift, spin-spin splitting and coupling constants, Anisotropic effect, Application of structure elucidation of simple organic molecules.

UNIT- IV

VI. Mass Spectrometery (12 Hrs)

Basic Principles, Elementary theory, Molecular ions, isotope ions, Fragment ions of odd and even electron types, Nitrogen rule, Factors affecting cleavage patterns, Simple cleavage, Cleavages at a hetero atom, Multicentre fragmentations, Rearrangements, Diels – Alder fragmentation, Mc Lafferty rearrangement, Interpretation of the spectrum of unknown simple molecules.

Books Recommended:

1. Organic Spectroscopy By W. Kemp; Publisher- Palgrave, NewYork
2. D.H. Williams and I. Fleming. Spectroscopic Methods in OrganicChemistry.
3. Spectrometric Identification of Organic Compounds - R.M. Silverstein and F. X. Webster; Publisher: John Willey and Sons,Inc.
4. Introductory Problems in Spectroscopy- By R.C. Banks, E.R. Matjeha and G. Mercer; Publisher : The Benzamine / Cummings Publishing CompanyInc.
5. Introduction to Spectroscopy – D. L. Pavia, G. M .Lampman, and G. S. Kriz Publisher: Brooks / Cole, a part of cengage learning.

Bachelor of Science
(SEMESTER–VI)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-6084(II)
COURSE TITLE: CHEMISTRY (PHYSICAL CHEMISTRY)

Course outcomes:

Students will be able to

CO1: understand schrodinger wave equation (S.W.E) and its applications to partical in one, two and three dimensional boxes.

CO2: understand the applications of S.W.E to rigid rotator, harmonic oscillators, hydrogen and hydrogen like atoms, quantum numbers

CO3: acquire knowledge about unit cell,space lattice, miller indices, symmetry operations, Bragg equation, powder method

CO4: understand photophysical, photo chemical, radioative and non-radiative processes, quantum yield, energy transfer processes

Bachelor of Science
(SEMESTER–VI)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-6084(II)
COURSE TITLE: CHEMISTRY (PHYSICAL CHEMISTRY)

Time: 3 Hrs. **Max. Marks: 30**

Note: Instructions for the Paper Setter

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT–I

1. Quantum Mechanics-I (12 Hrs)

Black-body radiation, Planck's radiation law, Photoelectric effect, heat capacity of solids, Bohr's
model of hydrogen atom (no derivation) and its defects, Compton effect. de Broglie hypothesis, Heisenberg's uncertainty principle, Sinusoidal wave equation, Hamiltonian operator, Schrodinger wave equation and its importance, physical interpretation of the wave function, postulates of quantum mechanics, particle in a one dimensional box, quantization of energy levels, extension to two and three dimensional boxes, degeneracy.

UNIT–II

2. Quantum Mechanics-II (12 Hrs)

Simple harmonic oscillator model of vibrational motion, setting up Schrodinger equation and discussion of solution and wave functions. Rigid rotator model of rotation of diatomic molecules
transformation to spherical polar coordinates spherical harmonics and their discussion. Qualitative
investigation H-atom, setting up Schrodinger equation, radial and angular part, radial distribution
functions of 1s, 2s, 2p, 3s, 3p and 3d.

UNIT–III

3. Solid State (10 Hrs)

Definition of space lattice and unit cell, Law of crystallography- (i) Law of constancy of interfacial

angles, (ii) Law of rationality of indices, (iii) Symmetry elements in crystals. X-ray diffraction by crystals.Derivation of Bragg's Law in Reciprocal space.Determination of crystal structure of NaCl, KCl by use of Powder method; Laue's method.

UNIT-IV

4. Photochemistry (11Hrs)

Interaction of radiation with matter, difference between thermal and photochemical processes. Laws of photochemistry: Grothus–Drapper law, Stark–Einstein law, Jablonski diagram depicting various processes occurring in the excited state, qualitative description of flourescence, phosphorescence, non–radiative processes (internal conversion, intersystem crossing), quantum yield, photosensitized reactions–energy transfer processes (simple examples).

Books Suggested :

1. Atkins, P., Paula, J.de, Atkins, Physical Chemistry; 8th edition, Pubs: Oxford University Press, 2008.
2. Puri, B.R., Sharma, L.R., Pathania, M.S., Principles of Physical Chemistry; 43rd edition, Pubs: Vishal Publishing Co., 2008.
3. Barrow, G.M., Physical Chemistry; 6th edition, Pubs: McGraw Hill Company Inc., 1996.
4. Rao, C.N.R., University General Chemistry; Pubs: Macmillan of India, 1985.
5. Berry, R.S., Rice, S.A., Ross, J., Physical Chemistry; 2nd edition, Pubs: Oxford University Press, 2000.
6. Albert, R.A., Silbey, R.J., Physical Chemistry; I edition, Pubs: John Wiley and Sons Inc., 1992.
7. Dogra, S.K., Dogra, S., Physical Chemistry Through Problems, Pubs: Wiley Eastern Ltd., 1991.
8. Levine, I.N., Physical Chemistry; 5th edition, Pubs : Tata McGraw Hill Publishing Co. Ltd.,
2002.
9. Moore, W.J., Basic Physical Chemistry; Pubs : Prentice Hall of India Pvt. Ltd., 1983.
10. Metz, C.R., Theory and Problems of Physical Chemistry; Schaum's outline series, 2nd edition, Pubs:McGraw-Hall Book Company, 1989.
11. Banwell, C.N., McCash, E.M., Fundamentals of Molecular Spectroscopy; 4th edition, Pubs:
Tata McGraw Hill Publishing Co. Ltd., 1999.
12. Atkins, P. Friedman, R., Molecular Quantum Mechanics; 4th edition Pubs: Oxford University Press, 2007.
13. Levine, I.N., Quantum Chemistry; 5th edition, Pubs: Prentice Hall International Inc., 2000.
14. Inorganic Chemistry, W.W. Porterfield Addison-Wesley.
15. Inorganic Chemistry, A.G. Sharpe, ELBS.

Bachelor of Science
(SEMESTER–VI)
SESSION: 2024-25
COURSE CODE: BSMM/BSNM-6084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Course outcomes:

Students will be able to

CO1:separate the various mixtures by Column Chromatography technique

CO2:synthesize different Organic Compounds

CO3:synthesise the different compounds by Green Approach

CO4:prepare the different dyes

Bachelor of Science
(SEMESTER–VI)
SESSION 2024-25
COURSE CODE: BSMM/BSNM-6084(P)
COURSE TITLE: CHEMISTRY PRACTICAL

Duration: 3½ hrs. **Max. Marks: 20**

Instruction for practical examiner: Question paper is to be set on the spot jointly by the Internal and External Examiners. Two copies of the same should be submitted for the record to COE office, KanyaMahaVidyalaya, Jalandhar.

(I) Organic Chemistry Laboratory Techniques

(a) Column Chromatography

Separation of o and p nitrophenol

Separation of Leaf pigments from Spinnach leaves

Separation of o and p nitro aniline

Separation of dyes.

(b) Synthesis of Organic Compounds

Preparation of p-nitroacetanilide

Preparation of p-bromoacetanilide

Preparation of benzilic acid from Benzyl-using green approach (Green Chemistry Experiment)

Preparation of Methyl Orange, Methyl Red

Practical Examination

1) Column Chromatography= 07

2) Organic Synthesis =16

3) Viva-Voce =04

4) Note Book= 03

Books suggested:

1. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai,

Tata McGraw Hill.

2. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.

3. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V.

Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.

4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.

Books suggested :

1. Experimental Organic Chemistry, Vol. I and II, P.R. Singh, D.S. Gupta and K.S. Bajpai, Tata McGraw Hill.
2. Laboratory Manual in Organic Chemistry, R.K. Bansal, Wiley Eastern.
3. Vogel's Textbook of Practical Organic Chemistry, B.S. Furniss, A.J. Hannaford, V. Rogers, P.W.G. Smith and A.R. Tatchell, ELBS.
4. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.
5. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.
6. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
7. Advanced Experimental Chemistry, Vol. I, Physical, J.N. Guru and R. Kapoor, S. Chand and Co.
8. Selected Experiments in Physical Chemistry, N.G. Mukherjee, J.N. Ghosh and Sons.
9. Experiments Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

FACULTY OF LIFE SCIENCES

SYLLABUS

of

Chemistry

for

Bachelor of Science (Biotechnology) (Semester VI)

(Under Continuous Evaluation System)

(12+3 System of Education)

Session: 2024-25

The Heritage Institution

KANYA MAHA VIDYALAYA

JALANDHAR

(Autonomous)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

SCHEME AND CURRICULUM OF EXAMINATION OF THREE YEAR DEGREE PROGRAMME

Bachelor of Science (Biotechnology) (Session 2024-25)

Chemistry

Bachelor of Science (Biotechnology) Semester-VI									
Course Name	**Program Name**	**Course Code**	**Course Type**	**Marks**					**Examination time (in Hours)**
				Total	**Paper**	**Ext.**		**CA**	
						L	**P**		
Chemistry-III	Bachelor of Science (Biotechnology)	BBTM-6085	C	60	Chemistry-III	30	-	12	3
					Chemistry-III (Practical)	-	18		3

Bachelor of Science (Biotechnology) Semester-VI

SESSION: 2024-25

COURSE CODE: BBTM-6085

COURSE TITLE: Chemistry-III

(Theory)

Course outcome:

Students will be able to

CO1: understand the various thermodynamic properties and laws of Thermodynamics.and acquire knowledge about the various thermodynamic terms like enthalpy of formation, enthalpy of ionisation, entropy, internal energy. Calculate entropy change for reversible and irreversible processes under isothermal and non-isothermal conditions and also absolute entropies of substances.

CO2:acquire the knowledge of structure and intermolecular forces present between solids, liquids and gases.

CO3 Understand the concept of reaction rates and determine the rate law from initial rate data.Determine the order of reaction with respect to each reactant, the overall order of reaction, the rate constant with units. learn about the Catalysis, hydrogenation Catalysis

CO4: understand the concept of Electrochemistry and various terms related to it like resistance, conductance, specific resistance, cell constant, EMF and determine the transference number of ions using Hittorf and moving boundary methods.

Bachelor of Science (Biotechnology) Semester-VI

SESSION: 2024-25

COURSE CODE: BBTM-6085

COURSE TITLE: Chemistry-III

(Theory)

Time: 3 Hrs. **Max. Marks: 60**

(Theory: 30, Practical: 18, CA: 12)

Instructions for the Paper Setters:

Eight questions of equal marks (6 each) are to be set, two in each of the four Sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any Section

UNIT-I

CHEMICAL THERMODYNAMICS:

Objectives and limitations of Chemical Thermodynamics, State functions, thermodynamic equilibrium, work, heat, internal energy, enthalpy. First Law of Thermodynamics : First law of thermodynamics for open, closed and isolated systems. Reversible isothermal and adiabatic expansion/compression of an ideal gas. Irreversible isothermal and adiabatic expansion. Enthalpy change and its measurement, standard heats of formation and absolute enthalpies. Kirchoff's equation. Second and Third Law: Various statements of the second law of thermodynamics. Efficiency of a cyclic process (Carnot's cycle).Entropy. Entropy changes of an ideal gas with changes in P,V, and T. Free energy and work functions. Gibbs-Helmholtz Equation. Criteria of spontaneity in terms of changes in free energy. Third law of thermodynamics: Absolute entropies. Thermodynamics of Simple Mixtures: Partial molar quantities and their significance. Chemical potential and its variation with T and P. Fugacity function and its physical significance. Concept of activity and activity coefficient.

UNIT-II

SOLUTIONS:

Ideal and non- ideal solutions, method of expression concentrations of solution, activity and activity coefficients, dilute solution, Osmotic pressure, its law and measurements, Elevation

of boiling point and depression of freezing points. Chemical Equilibrium : General characteristics of chemical equilibrium, thermodynamic derivation of the law of chemical equilibrium, Van't Hoff reaction isotherm. Relation between Kp, Kc and Kx. Temperature dependence of equilibrium constant Van't Hoff equation, homogeneous & heterogreneous equilibria, Le Chetalier's principle.

UNIT-III

CHEMICAL KINETICS AND CATALYSIS:

Scope, rate of reaction, influencing factors such as concentration, temperature, pressure, solvent etc. theories of chemical kinetics. Arrhenius equation, concept of activation energy. Rates of reactions, rate constant, order and molecularity of reactions. Chemical Kinetics: Differential rate law and integrated rate expressions for zero, first, second and third order reactions. Half-life time of a reaction. Methods for determining order of reaction. Effect of temperature on reaction rate and the concept of activation energy. Reaction mechanism. Steady state hypothesis. Catalysis : Homogeneous catalysis, Acid-base catalysis and enzyme catalysis (Michaelis-Menten equation). Heterogeneous catalysis. Unimolecular surface reactions.

UNIT-IV

ELECTRO-CHEMISTRY:

Specific conductance, molar conductance and their dependence on electrolyte concentration. Ionic Equilibria and conductance, Essential postulates of the Debye-Huckel theory of strong electrolytes. Mean ionic activity coefficient and ionic strength. Transport number and its relation to ionic conductance and ionic mobility. Conductometric titrations. pH scale. Buffer solutions, salt hydrolysis.Acid-base indicators.

Books Recommended:

1. Physical Chemistry by Samuel H, Carl P. Putton; 4th Edition, Americ Inc. Co.
2. Physical Chemistry by Glassstone, 2ndEdition,TheMacmillian Press Ltd.
3. Kinetic and Mechanism by Frost A and Pearson R.G, 3rd Edition, Wiley Eastern Pvt. Ltd.
4. Chemical Kinetic by K.J. Laidler, Harper and Row.
5. Physical Chemistry by Glberg W. Castellian Addison:3rd Revised Edition Wesley publishing Comp
6. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry, Ed. V and VI. Wiley Inter-science

Bachelor of Science (Biotechnology) Semester-VI

SESSION: 2024-25

COURSE CODE: BBTM-6085(P)

COURSE TITLE: Chemistry-III

(Practical)

Course outcome:

Students will be able to

CO1: know the principle and mechanism of Conductometric titrations and polarimetric experiments

CO2: determine the heat of of neutralization and Heat of solution Calorimetrically

CO3: verify Beer Lambert Law for different solutions.

CO4: determine the pH of the solution and analyze optical active substances

Bachelor of Science (Biotechnology) Semester-VI
SESSION: 2024-25
COURSE CODE: BBTM-6085(P)
COURSE TITLE: Chemistry-III
(Practical)

Time: 3 Hrs. **Practical Marks: 18**

Instructions for the practical Examiner: Question paper is to be set on the spot jointly by the internal and external examiners. Two copies of the same may be submitted for the record to COE Office, Kanya Maha Vidyalaya, Jalandhar.

Books Recommended:

1. Calorimetry:
a) Determination of Heat of neutralization
(i) Strong acid-strong base
(ii) Weak acid-strong base.
b) Determination of Heat of solution of KCl, NH4Cl, KNO3
2. Conductometry:
a) Determination of cell constant.
b) Determination of specific and equivalent conductance of electrolyte (NaCl and HCl).
c) Precipitation titration of Na2SO4 vs. BaCl2.
d) Neutralization titrations NaOH vs. HCl and NaOH vs. CH3COOH.
3. Photometry.
Verification of Lambert beer's law for solution of CoCl2H2O (in water) and K2Cr2O7 (in water)
4. a) pH of buffer solution
b) Acid base titration HCl vs. NaOH.
c) Determination of ionization constant of a weak acid (CH3COOH)
5. Determine composition of HCl and CH3COOH in the given solution pH metrically.
6. Polarimetry: Determine the %age composition of an optically active solution.

Books Recommended:

1. Experiments in General Chemistry, C.N.R. Rao and U.C. Aggarwal, East-West Press.
2. Experiments in Physical Chemistry, R.C. Das and B. Behra, Tata McGraw Hill.
3. Advanced Practical Physical Chemistry, J.B. Yadav, Goel Publishing House.
4. Advanced Experimental Chemistry, Vol. I, Physical, J.N. Guru and R. Kapoor, S. Chand and Co.
5. Selected Experiments in Physical Chemistry, N.G. Mukherjee, J.N. Ghosh and Sons.
6. Experiments Physical Chemistry, J.C. Ghosh, Bharati Bhavan.

ANNEXURE G

FACULTY OF SCIENCES

SYLLABUS FOR THE

SUBJECT: CHEMISTRY

For the award of the Degree in

Bachelor of Science/Honours

(Offered under 4 Year U.G. Degree Programme)

(Credit Based Continuous Evaluation Grading System)

Under NEP-2020

Semester I-II

Session: 2024-25

The Heritage Institution
KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF FOUR YEAR UNDER GRADUATE DEGREE PROGRAMME

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)

Bachelor of Science/Honours (Semester I)										
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Course Code**	**Course Type**	**Total marks**	**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
							L	**P**		
Chemistry	4-0-0	4-0-0	BSNL/BSML-1084	C	100	Inorganic Chemistry-I: Atomic structure and periodic table	75	-	25	3
	0-0-4	0-0-2	BSNP/BSMP-1084	C	50	INORGANIC CHEMISTRY-I: Lab Qualitative Analysis (PRACTICAL)	-	40	10	3.5

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: BSNL/BSML-1084
COURSE TITLE: Inorganic Chemistry-I: Atomic structure and periodic table

Course Outcomes:

Students will be able to

CO1: Predict electronic properties of atoms using current models and theories in chemistry, sketch the probability density curves, identify the periodic trends in physical and chemical properties of elements, describe the arrangement of the elements in the Periodic Table& change from metallic to nonmetallic character.

CO2: Describe VBT, VSEPR theory and predicts the geometry of simple molecules & molecular orbital theory of homonuclear diatomic molecules, explain, predict & draw structures of simple ionic compounds.

CO3: Explains & compares the trends in atomic and physical properties of p-block elements, explain the atomic, physical and chemical properties of alkali metals and alkaline earth metals and concepts of Acids and Bases.

CO4: Detailed studies of Group 13 and 14 of p-block elements.

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: BSNL/BSML-1084
COURSE TITLE: Inorganic Chemistry-I: Atomic structure and periodic table

Exam Time: 3Hrs. **Max. Marks: 100**
Credit(L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Instructions for the Paper Setters: Eight questions of equal marks (Sixteen marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

SECTION-A **(15 Hrs.)**

Atomic Structure- Idea of de Broglie matter waves, Heisenberg uncertainty principle, atomic orbitals, Schrodinger wave equation, Quantum numbers, Shapes of s, p, d and f orbitals. Aufbau's and Pauli's Exclusion principle, Hund's multiplicity rule. Electronic configurations of the elements and ions.

Periodic Properties- Position of elements in the periodic table; effective nuclear charge and its calculations. Details of atomic and ionic radii, ionization energy, electron affinity and electronegativity.

SECTION-B **(15 Hrs.)**

Ionic Solids: Concept of close packing, Ionic structures, radius ratio rule and coordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy and Born–Haber cycle. Fajan's rule, Weak Interactions –Hydrogen bonding, van der Waals forces.

Chemical Bonding-I: Covalent Bond–Valence bond theory and its limitations, directional characteristics of covalent bond, various types of hybridization and shapes of simple inorganic molecules and ions, Valence shell electron pair repulsion (VSEPR) theory, homonuclear and heteronuclear diatomic molecules. Multicentre bonding in boranes, Percentage ionic character from dipole moment and electronegativity difference.

SECTION-C (15 Hrs.)

s- and p-block elements and their comparative study: General remarks about each group (I-VIII), trends in electronic configuration, atomic and ionic radii, ionization potential, electron affinity, electronegativity, oxidation states, Melting and boiling point, density, electropositive or metallic character, flame colouration. Lattice energies. Photoelectric effect, inert pair effect, catenation and hetero catenation. Anomalies in first and second row elements. Chemical properties in details.

Acids and Bases: Arrhenius, Bronsted-Lowry, the Lux-Flood, solvent system and Lewis concepts of acids and bases

SECTION-D (15 Hrs.)

p-Block Elements: Group 13: General characteristics, Atomic and ionic radii, melting and boiling point, Ionisation energies, Oxidation states, Electropositive character, Tendency to form covalent compounds. **Compounds of group 13**: Hydrides, Oxides and hydroxides, Oxoacid; Structure and Properties of Boric acid, Preparation, properties and structure of Diborane, Borazine, Boron halides: Boron hydrides ($LiBH_4$, $NaBH_4$), Anomalous behaviour of Boron and its diagonal relationship with Silicon.

Group 14: General characteristics; Atomic radii, Ionisation energies, Melting and boiling point, oxidation state, metallic character, catenation, Allotropy, Tendency to form multiple bonding. **Compounds of group 14**: Hydrides of silicon: preparation and properties, toxic nature of CO, Dioxide of carbon and silicon. Comparison of carbon tetrachloride and silicon tetrachloride. Chemistry of Fullerenes.

Books Suggested

1. Cotton, F.A., Wilkinson, G., Gaus, P.L., Basic Inorganic Chemistry; 3rd edition, Pubs: John Wiley Sons. 1995.
2. Lee, J.D., Concise Inorganic Chemistry; 4th edition, Pubs: Chapman Hall Ltd., 1991.
3. Shriver, D.E., Alkins, P.W., Langford, C.H., Inorganic Chemistry; 4th edition, Oxford Publisher: Oxford University Press, 2006.
4. Douglas, B. McDamiel, D., Alexander, J., Concepts and Models of Inorganic Chemistry; 3rd edition, Pubs: John Wiley and Sons Inc., 1994.
5. Miessler, G.L., Larr, D.A., Inorganic Chemistry; 3rd edition, Pubs: Pearson EducationInc., 2004.
6. Jolly, W.L., Modern Inorganic Chemistry; 2nd edition, Pubs: McGraw-Hill Publishing Company Limited, 1991.
7. Purcell, K.F., Kotz, J.C., Inorganic Chemistry; Pubs: W.B. Saunders Company, 1977.
8. Puri, B.R., Sharma, L.R., Kalia, K.C., Principles of Inorganic Chemistry; 30th edition, Pubs: Milestones Publisher, 2006-07.

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: BSNP/BSMP-1084
COURSE TITLE : INORGANIC CHEMISTRY-I:
Lab Qualitative Analysis(PRACTICAL)

Course outcomes

Students will be able

CO1: To develop technical skills relevant to quantitative analysis

CO2: To separate and identify the various ions present in the mixture

CO3: To understand and master the technique of volumetric analysis

CO4: To analyze an acidic and alkali content in different samples

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: BSNP/BSMP-1084
COURSE TITLE : INORGANIC CHEMISTRY-I: Lab Qualitative Analysis (PRACTICAL)

Time: 4 Hrs **Marks: 50**

Credits: 0-0-2 **(Practical: 40, CA: 10)**

Semi Micro analysis. Cation analysis, Separation and identification of ions from groups I, II,III, IV, V, and VI. Anionic analysis. Four ions with no interference.

Volumetric titrations

1. Determination of strength of Na_2CO_3 solution by titrating it against a standard solution of HCl.
2. Determination of molarity of $KMnO_4$ solution by titrating it against a standard solution of Oxalic acid.
3. Standardise the given $K_2Cr_2O_7$ solution by titrating it against a standard solution Of Mohr's Salt.
4. Estimation of free alkali present in different soaps/detergents
5. Estimation of Cu(II) and $K_2Cr_2O_7$ using sodium thiosulphate solution (Iodimetrically).
6. Estimation of available chlorine in bleaching powder iodometrically.

Books Suggested

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF FOUR YEARS UNDER GRADUATE DEGREE PROGRAMME

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)

Bachelor of Science/Honours (Semester II)										
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Course Code**	**Course Type**	**Total marks**	**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
							L	**P**		
Chemistry	4-0-0	4-0-0	BSNL/BSML-2084	C	100	Organic Chemistry-I: Hydrocarbons and alkyl halides	80	-	20	3
	0-0-4	0-0-2	BSNP/BSMP-2084	C	50	Organic Chemistry-I: Lab Functional group analysis	-	40	10	3.5

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester II)
COURSE CODE: BSNL/BSML-2084
COURSE TITLE: ORGANIC CHEMISTRY-I: Hydrocarbons and Alkyl Halides
(THEORY)

Course outcomes:

Students will be able to

CO1: interpret the bonding, hybridization between different organic compounds, explain the various reaction mechanisms and different electron displacement effects

CO2: interpret the reactions and properties of alkanes, alkenes & alkynes, derive the electrophilic, nucleophilic addition reactions, free radical mechanisms of halogenation of alkanes.

CO3: differentiate between aromatic, anti-aromatic and non-aromatic compounds, explain the effect of various substituents on the reactivity of aromatic compounds

CO4: learn about the basic chemistry of organic compounds along with methods of formation and reactions of alkyl halides and their derivatives.

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester II)
COURSE CODE: BSNL/BSML-2084
COURSE TITLE: ORGANIC CHEMISTRY-I: Hydrocarbons and Alkyl Halides
(THEORY)

Exam Time: 3Hrs. **Max. Marks: 100**

Credit(L-T-P): 4-0-0 **(Theory: 80, CA: 20)**

Instructions for the Paper Setters: Eight questions of equal marks (Sixteen marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

Hybridization, Use of arrows, Types of reagents, Reactive Intermediates: Carbocations, Carbanions, Free radicals Carbenes, arenes and Nitrenes. Stereochemistry: Fischer Projection, Newmann and Sawhorse Projection formulae and their interconversions, Geometrical isomerism, E/Z notations with C.I.P rules, Optical Activity, enantiomeric and diastereomeric excess, Chirality/Asymmetry, Enantiomers, Diastereoisomers, Racemic mixture and resolution, optical activity in absence of chiral carbon, Relative and absolute configuration: D/L and R/S designations

SECTION-B

Chemistry of alkanes: methods of formation of alkanes, Free radical substitutions: Halogenation - relative reactivity and selectivity. Cycloalkanes and Conformational Analysis: Baeyer strain theory, Conformation analysis, relative stability and energy diagrams of ethane, propane, butane, cyclohexane and Chair, Boat and Twist boat forms of cyclohexane.

Chemistry of alkenes/alkynes: Nomenclature and Formation of alkenes and alkynes, Mechanism of E1 and E2 reactions, Saytzeff and Hofmann eliminations. Mechanisms and Reactions of alkenes, reduction, syn and anti-hydroxylation (oxidation), 1, 2- and 1,4- addition reactions in conjugated dienes and Diels-Alder reaction, mechanism of allylic and benzylic bromination. Reactions of alkynes.

SECTION-C

Aromaticity: Huckel's rule, Structure of benzene: Molecular formula and Kekule structure. Stability and C-C bond lengths of benzene, resonance structure. Aromatic electrophilic substitution–general pattern of the mechanism, role of σ and π complexes. Mechanism of nitration, halogenation, sulphonation, mercuration and Friedel Crafts reaction. Energy profile diagrams. Activating and deactivating substituents, reactivity and orientation of disubstitution. Side chain reactions of benzene derivatives. Methods of formation and chemical reactions of alkylbenzenes.

SECTION-D

Alkyl halides: Methods of preparation, details of nucleophilic substitution reactions – SN1, SN2 and SNi mechanisms with stereochemical aspects and effect of solvent, nucleophilic substitution vs. elimination. Aryl halides: Preparation, including preparation from diazonium salts, nucleophilic aromatic substitution in details; SNAr, Benzyne mechanism. Relative reactivity and mechanism of alkyl, allyl/benzyl, vinyl and aryl halides towards nucleophilic substitution reactions in detail.

Books suggested

1. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd.(Pearson Education).
2. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
3. Solomons, T. W., Fryhle, C.B., Organic Chemistry; 9th edition, Pubs: Wiley India, 2007.
4. Wade Jr., L.G., Singh, M.S., Organic Chemistry; 6th edition, Pubs: Pearson Education,2008.
5. Fundamentals of Organic Chemistry, Solomons, John Wiley.
6. Introduction to Organic Chemistry, Sireitwieser, Heathcock and Kosover, Macmilan.
7. Kalsi, P. S. Stereochemistry Conformation and Mechanism, New Age International, 2005.
8. McMurry, J. E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning IndiaEdition, 2013.
9. Eliel, E. L. & Wilen, S. H. Stereochemistry of Organic Compounds, Wiley: London,1994.

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester II)
COURSE CODE: BSNP/BSMP-2084
COURSE TITLE : ORGANIC CHEMISTRY-I: Lab Functional Group Analysis (PRACTICAL)

Course outcomes:

Students will be able to analyze the given organic compound through

CO1:understand the basics of Qualitative analysis

CO2: detection of elements (N, S and halogens) in organic compounds.

CO3:detection of functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, amines,amides, nitro and anilide) in simple organic compounds

CO4: preparation of their derivatives

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester II)
COURSE CODE: BSNP/BSMP-2084
COURSE TITLE : ORGANIC CHEMISTRY-I: Lab Functional Group Analysis (PRACTICAL)

Time: 4 Hrs **Marks: 50**

Credits: 0-0-2 **(Practical: 40, CA: 10)**

Basic techniques on purification of organic compounds. Determination of melting point and boiling point of organic compounds. Detection of nitrogen, halogens and sulphur in organic compounds. Qualitative analysis of unknown organic compounds containing simple functional groups.

Books Suggested

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5 th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: QualitativeAnalysis, University Press (2000).

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science/Honours (Sem I)

Course Title:Inorganic Chemistry-I: Atomic structure and periodic table
Course Code: BSNL/BSML-1084
Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Ms. Meenakshi Bhanot	1. Ms. Meenakshi Bhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	2. Mr. Ravi Sharma	2. Mr. Ravi Sharma
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9501035918	9501035918
E-mail	ravi.dav1923@gmail.com	ravi.dav1923@gmail.com
Name	3. Dr. Paramjit Kaur	3. Dr. Paramjit Kaur
Designation	Ass. Professor	Ass. Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	4.Dr. Sangeeta Sharma	4.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	5. Mr. Rajesh Mittu	5. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science/ Honours (Sem I)

Course Title: INORGANIC CHEMISTRY-I: Lab Qualitative Analysis (PRACTICAL)

Course Code: BSNP/BSMP-1084

	Practical Examiner
Name	1. Mr. Kuldeep Yadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	Doaba College,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	Doaba College,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3. Mrs. Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D. Arya College, JRC-144005
Contact no	9814677064
E-mail	mkhosla48@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

KanyaMahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science/Honours (Sem II)
Course Title: ORGANIC CHEMISTRY-I: Hydrocarbons and Alkyl Halides (THEORY)
Course Code: BSNL/BSML-2084
Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr.Roopa	1. Dr.Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr.AmarjitKaur	2. Dr.AmarjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Hoshiarpur	Govt. College, Hoshiarpur
Residential Address with Pin Code		
Contact no	9463905804	9463905804
E-mail	amarjit_kaur70@yahoo.com	amarjit_kaur70@yahoo.com
Name	3. Ms.Meenakshi Bhanot	3. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	4.Dr.Paramjit Kaur	4.Dr.Paramjit Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurthala	BebeNanki University College, Mithra, Kapurthala
Residential Address with Pin Code		
Contact no	814627202	814627202
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

KanyaMahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science/ Honours (Sem II)

Course Title: ORGANIC CHEMISTRY-I: Lab Functional Group Analysis(PRACTICAL)

Course Code: BSNP/BSMP-2084

	Practical Examiner
Name	1. Mr.KuldeepYadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3. Mrs. Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D. Arya College, JRC-144005
Contact no	9814677064
E-mail	mkhosla48@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF FOUR YEARS UNDER GRADUATE DEGREE PROGRAMME

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)
Semester II

Course Name	Hours Per Week L-T-P	Credits L-T-P	Course Code	Course Type	Total marks	Ext.			Examination Time (in Hours)
						L	P	CA	
From Molecules to Markets: Entrepreneurship in Chemistry	2-0-2	2-0-1	SECC-2084	C	75	40	20	15	3+3

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester II)
COURSE CODE: SECC-2084
COURSE TITLE : From Molecules to Markets: Entrepreneurship in Chemistry

Course Outcomes

Upon Completion of this course, the student will be able:

CO1: To understand importance of chemistry in daily life.

CO2: To develop better understanding and reasoning of facts.

CO3: To skill up various laboratory techniques used in pharmaceutical and chemical industries

CO4: Hands on experience for manufacturing industries.

Bachelor of Science/Honours
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester II)
COURSE CODE: SECC-2084
COURSE TITLE : From Molecules to Markets:Entrepreneurship in Chemistry

Exam Time: 3Hrs. **Max. Marks: 75**

Credit(L-T-P): 2-0-1 **(Theory: 40, Practical:20, CA: 15)**

Instructions for the Paper Setters: Eight questions of equal marks (Eight marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Unit 1

Cleaning agents

Soaps and detergents: Types (cationic and anionic), physical and chemical characteristics, advantages and disadvantages. Examples of Commercially available cleaning agents (shampoo, hand wash, face-wash)

Unit 2

Disinfectants
Introduction, types, physical and chemical properties, classification (acids, alcohols, aldehydes, alkalis, halogens, phenols)
Sanitizers
Sanitizers-Introduction, types, raw material used in making professional hand sanitizer with properties, WHO recommendations for hand sanitizers.

Unit 3

Cosmetics
Oils, fats, and waxes - Introduction, physical and chemical properties, their use in cosmetics, Preservatives-Introduction, properties, types and their significance.

Unit 4

Transition to Greener approach
Importance and Principles of Green Chemistry, bio-enzymes as disinfectants, green cosmetics-make up, shampoo, face pack, face mask, lipsticks.

Practicals:

1. Preparation of Soaps.
2. Preparation of liquid detergent using animal fat.
3. Preparation of Hand-Sanitizers.
4. Preparation of Disinfectants.
5. Preparation of cleaning agents using bio-enzymes.

Books Suggested :

1. New Cosmetic Science by Takeo Mitsui
2. Cosmetic Science and Technology by Sargin C.B
3. Surfactants in personal care products and decorative cosmetics-Third edition by Linda D. Rhein, Anthony O'Lenick.
4. Handbook on Synthetic detergents by B.P. Sen.
5. Liquid Detergents, 2nd Edition by Kuo-Yann Lai.
6. Soap-Making Manual A Practical Handbook on the Raw Materials, Their Manipulation, Analysis and Control in the Modern Soap Plant (E-Book) by Mylene Stedmen.

KanyaMahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science/Honours (Sem II)
Course Title: From Molecules to Markets:Entrepreneurship in Chemistry (Theory)
Course Code: SECC-2084
Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr.Roopa	1. Dr.Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr.AmarjitKaur	2. Dr.AmarjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Hoshiarpur	Govt. College, Hoshiarpur
Residential Address with Pin Code		
Contact no	9463905804	9463905804
E-mail	amarjit_kaur70@yahoo.com	amarjit_kaur70@yahoo.com
Name	3. Ms.Meenakshi Bhanot	3. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	4.Dr.Paramjit Kaur	4.Dr.Paramjit Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurthala	BebeNanki University College, Mithra, Kapurthala
Residential Address with Pin Code		
Contact no	814627202	814627202
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

KanyaMahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science/ Honours (Sem II)

Course Title: From Molecules to Markets:Entrepreneurship in Chemistry (Practical)

Course Code: SECC-2084(P)

	Practical Examiner
Name	1. Mr.KuldeepYadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3. Mrs. Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D. Arya College, JRC-144005
Contact no	9814677064
E-mail	mkhosla48@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

ANNEXURE H

FACULTY OF SCIENCES

SYLLABUS FOR THE

SUBJECT: CHEMISTRY

For the award of the Degree in

Master of Science (FYIP) Physics

(Credit Based Continuous Evaluation Grading System)

Under NEP-2020

Semester I-II

Session: 2024-25

The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR
(AUTONOMOUS)

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF FIVE YEAR INTEGRATED PROGRAMME

Master of Science (FYIP) Physics
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)

Master of Science (FYIP) Physics (Semester I)										
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Course Code**	**Course Type**	**Total marks**	**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
							L	**P**		
Chemistry	3-0-0	3-0-0	FPHL-1086	**C**	75	Organic Chemistry (Theory)	60	-	15	3
	0-0-2	0-0-1	FPHP-1088	**C**	25	Organic Qualitative Analysis (PRACTICAL)	-	20	05	3

Master of Science (FYIP) Physics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHL-1086

COURSE TITLE: ORGANIC CHEMISTRY
(THEORY)

Course outcomes:

Students will be able to

CO1: learn about the basic chemistry of organic chemistry.

CO2: interpret the reactions and properties of alcohols and Phenols and provide basic knowledge of organic reaction mechanisms.

CO3: understand preparations and reactions of ethers and epoxides, understand cleavages in ethers, the ring opening reactions of epoxides.

CO4: to resolve the different enantiomers and differentiate between dextrorotatory-leavorotatory chiral and achiral compounds,understand the concept of isomerism, conformation and configuration.

Master of Science (FYIP) Physics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHL-1086
COURSE TITLE: ORGANIC CHEMISTRY
(THEORY)

Exam Time: 3Hrs. **Max. Marks: 75**
Credit(L-T-P): 3-0-0 **(Theory: 60, CA: 15)**

Instructions for the Paper Setters: Eight questions of equal marks (Sixteen marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

Basics concepts of Organic Chemistry: Classification and Nomenclature of organic compounds. Electronic Effects: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation. Reactive intermediates: carbocations, carbanions, free radicals. Electrophiles and Nucleophiles. Nucleophilicity and basicity. Relative strengths of acids and bases, concept of p*K*a, effect of substituents and steric effects of substituents.

SECTION-B

Chemistry of functional groups–I: Selective methods of preparation: dehydration of alcohols, dehydrohalogenation of alkyl halides with complete mechanistic discussion. (E mechanism), Saytzeff's rule. Reactions: addition of hydrogen halides (Markovnikov's and anti-Markovnikov's addition), halogen addition to alkenes, epoxidation of alkenes. Acidity of acetylene, Birch reduction, addition of hydrogen halides and water to alkynes, Diels-Alder reaction.

SECTION-C

Chemistry of functional groups–II: Ethers and Epoxides: methods of their formation, Chemical reactions Cleavage and autoxidation, Zeisel's method, Acids and base catalysed ring opening of epoxide, Alkyl Halides, Types of Nucleophilic Substitution (SN1, SN2) reactions, solvent effect, substitution and elimination as competing reactions. Principles of nucleophilic addition to carbonyl groups: acetal formation, cyanohydrins formation; reactions with primary and secondary amines, Witting reaction, aldol condensation

SECTION-D

Stereochemistry: Introduction, Conformations of ethane and butane. Interconversion of Wedge Formula, Newmann, Sawhorse and Fischer representations. Configuration: Geometrical and Optical isomerism, Molecular chirality, optical activity, absolute and relative configuration, the Cahn-Ingold Perlog R-S notional system, physical properties of enantiomers, naming stereo isometric alkenes by the E/Z system.

Books suggested

1. R.T. Morison and R.N Boyd, Organic Chemistry.
2. I.L. Finar, Organic Chemistry, Vol. I- IV
3. J. March, Advanced Organic Chemistry, Reactions Mechanism and Structure.
4. F.A. Carey, Organic Chemistry.

Master of Science (FYIP) Physics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHP-1088
COURSE TITLE : QUALITATIVE ORGANIC ANALYSIS (PRACTICAL)

Course outcomes:

Students will be able to analyze the given organic compound through

CO1:understand the basics of Qualitative analysis

CO2: detection of elements (N, S and halogens) in organic compounds.

CO3:detection of functional groups (phenolic, carboxylic, carbonyl, esters, carbohydrates, amines,amides, nitro and anilide) in simple organic compounds

CO4: preparation of their derivatives

Master of Science (FYIP) Physics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHP-1088
COURSE TITLE : QUALITATIVE ORGANIC ANALYSIS (PRACTICAL)

Time: 2 Hrs **Marks: 25**

Credits: 0-0-1 **(Practical: 20, CA: 05)**

The preliminary examination of physical and chemical characteristics (Physical state, colour and odour), elemental analysis (nitrogen, sulphur, chlorine, bromine, iodine), solubility tests including acid-base reactions, classification tests involving functional reactivity other than acid-base test. The following categories of compounds should be analysed phenols, carboxylic acids, carbonyl compounds- ketones and aldehydes, aromatic amines, amides.

Books Suggested

1. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)
2. Furniss, B.S., Hannaford, A.J., Smith, P.W.G. & Tatchell, A.R. Practical Organic Chemistry, 5 th Ed. Pearson (2012)
3. Ahluwalia, V.K. & Aggarwal, R. Comprehensive Practical Organic Chemistry: Preparation and Quantitative Analysis, University Press (2000).
4. Ahluwalia, V.K. & Dhingra, S. Comprehensive Practical Organic Chemistry: Qualitative Analysis, University Press (2000).

KANYA MAHA VIDYALAYA JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF FIVE YEAR INTEGRATED DEGREE PROGRAMME

Master of Science (FYIP) Physics
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Session: 2024-2025)

Master of Science (FYIP) Physics (Semester II)										
Course Name	**Hours Per Week L-T-P**	**Credits L-T-P**	**Course Code**	**Course Type**	**Total marks**	**Paper**	**Ext.**		**CA**	**Examination Time (in Hours)**
							L	**P**		
Chemistry	4-0-0	4-0-0	FPHL-2086	**C**	75	Inorganic Chemistry-I: Atomic structure and periodic table	60	-	15	3
	0-0-2	0-0-1	FPHP-2088	**C**	25	Inorganic Chemistry Lab (PRACTICAL)	-	20	05	3

Master of Science (FYIP) Physics
Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHL-2086
COURSE TITLE: Inorganic Chemistry-I: Atomic structure and periodic table

Course Outcomes:

Students will be able to

CO1: Describe VBT, VSEPR theory and predicts the geometry of simple molecules & molecular orbital theory of homonuclear diatomic molecules, explain, predict & draw structures of simple ionic compounds.

CO2: To enrich the factual knowledge of chemistry related to theories of coordination complexes and calculation of C.F.S.E.

CO3: To develop an understanding of the concepts of structure and bonding of inorganic complexes and calculate microstates and spectroscopic terms.

CO4: To familiarize with π-acid ligands.

Master of Science (FYIP) Physics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHL-2086
COURSE TITLE: Inorganic Chemistry-I: Atomic structure and periodic table

Exam Time: 3Hrs. **Max. Marks: 75**
Credit(L-T-P): 3-0-0 **(Theory: 60, CA: 15)**

Instructions for the Paper Setters: Eight questions of equal marks (Twelve marks each) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

SECTION-A

Introduction, Werner's coordination theory, naming of co-ordinate complexes. Co-ordination numbers 1-12 and their stereo-chemistries. Factors affecting co-ordination number and stereochemistry. Configurational Isomers, Conformational isomerism, VSPER theory, molecular orbital theory applied to homo-nuclear diatomic molecules. Bonding in metal complexes, Valence bond theory for co-ordinate complexes, inner and outer orbital complexes, Electro-neutrality and back bonding, limitations of V.B. theory.

SECTION-B

Stability of coordination compoundsIntroduction, Stability constant, stepwise stability constant, overall stability constant. Factors affecting the stability of metal ion complexes with general ligands, HSAB principle.Crystal field theory- Splitting of d-orbitals in octahedral, tetrahedral, cubic and square planar fields of ligands. Calculation of C.F.S.E. in high spin and low spin octahedral and High spin tetrahedral complexes, factors affecting the 10 Dq Value. Structural effects of crystal field splitting- Jahn-Teller distortion, variation of Ionic radii with increase in atomic number. Paramagnetism, diamagnetism, ferro and anti ferromagnetism.

SECTION-C

Microstates and spectroscopic terms, a calculation of spectroscopic terms for d1 - d10 electronic configurations, L S coupling, Hund's rule for finding the ground state terms, Electronic spectral properties of Ist transition series, Orgel Diagrams for d1 - d10 systems, for weak field octahedral and tetrahedral complexes, limitations of C.F.T.

SECTION-D

π -Acid Ligands definition Carbon monoxide complexes, bonding in linear MCO groups, polynuclear metal carbonyls, vibrational spectra, carbonyl hydrides and halides. Metal-metal bonding, metal metal multiple bonding, Structure of high nuclearity carbonyl clusters, counting of electrons in carbonyl clusters.

Reference Books:

1. J.E. Huheey, Inorganic Chemistry, 3rd Ed.
2. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry.
3. B.E. Douglas and D.H. McDaniel, Concepts and Models of Inorganic Chemistry.

Master of Science (FYIP) Physics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHP-2088
COURSE TITLE : INORGANIC CHEMISTRY LAB
(PRACTICAL)

Course outcomes

Students will be able

CO1: To develop technical skills relevant to quantitative analysis.

CO2: Will have knowledge of cationa and anions.

CO3: To separate and identify the various ions present in the mixture.

CO4: To perform confirmatory tests of various ions present in the mixture.

Master of Science (FYIP) Physics

Credit Based Continuous Evaluation Grading System (CBCEGS)
(Under NEP 2020)
(Session: 2024-2025)
(Semester I)
COURSE CODE: FPHP-2088
COURSE TITLE : INORGANIC CHEMISTRY LAB
(PRACTICAL)

Time: 2 Hrs **Marks: 25**

Credits: 0-0-1 **(Practical: 20, CA: 05)**

1. Identification of cations and anions in a mixture which may contain four ions (cations and anions).

2. Perform systematic group analyses to identify the cations in the mixture. Any cation from Group I, Group II (Group IIA and IIB) Group IV, Group V and Group VI may be present.

Reference Books:

Vogel's book on Inorganic Qualitative Analysis

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme:Master of Science (FYIP) Physics (Sem I)

Course Title:Organic Chemistry (Theory) Course Code: FPHL-1086

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Ms. Meenakshi Bhanot	1. Ms. Meenakshi Bhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	2. Mr. Ravi Sharma	2. Mr. Ravi Sharma
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9501035918	9501035918
E-mail	ravi.dav1923@gmail.com	ravi.dav1923@gmail.com
Name	3. Dr. Paramjit Kaur	3. Dr. Paramjit Kaur
Designation	Ass. Professor	Ass. Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	4.Dr. Sangeeta Sharma	4.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	5. Mr. Rajesh Mittu	5. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme:Master of Science (FYIP) Physics (Sem I)

Course Title: QUALITATIVE ORGANIC ANALYSIS (PRACTICAL)

Course Code: FPHP-1088

	Practical Examiner
Name	1. Mr. Kuldeep Yadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	Doaba College,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	Doaba College,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3. Mrs. Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D. Arya College, JRC-144005
Contact no	9814677064
E-mail	mkhosla48@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

KanyaMahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme:Master of Science (FYIP) Physics (Sem II)

Course Title: Inorganic Chemistry-I: Atomic structure and periodic table (THEORY)

Course Code: FPHL-2086

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr.Roopa	1. Dr.Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr.AmarjitKaur	2. Dr.AmarjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Hoshiarpur	Govt. College, Hoshiarpur
Residential Address with Pin Code		
Contact no	9463905804	9463905804
E-mail	amarjit_kaur70@yahoo.com	amarjit_kaur70@yahoo.com
Name	3. Ms.Meenakshi Bhanot	3. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	4.Dr.Paramjit Kaur	4.Dr.Paramjit Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurthala	BebeNanki University College, Mithra, Kapurthala
Residential Address with Pin Code		
Contact no	814627202	814627202
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____

E-mail: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.

3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

KanyaMahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme:Master of Science (FYIP) Physics (Sem II)

Course Title: INORGANIC CHEMISTRY LAB (PRACTICAL)

Course Code: FPHP-1088

	Practical Examiner
Name	1. Mr.KuldeepYadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3. Mrs. Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D. Arya College, JRC-144005
Contact no	9814677064
E-mail	mkhosla48@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

ANNEXURE I

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry)(Sem I)

Course Title: Ligand Field Theory (Theory) Course Code: MCHL-1081

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Vimal Kumar Bhardwaj	1.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	89681-55223	89681-55223
E-mail	bhardwajvk@nitj.ac.in	bhardwajvk@nitj.ac.in
Name	2. Dr. Rupy Dhir	2. Dr. Rupy Dhir
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Chemistry Department, GSSDGS Khalsa College, Patiala	Chemistry Department, GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	9465208678	9465208678
E-mail	rupydhir431@yahoo.com	rupydhir431@yahoo.com
Name	3.Dr. Sangeeta Sharma	3.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	4.Mr. Vikrant Rana	4.Mr.Vikrant Rana
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College, Mahilpur	SGGS Khalsa College, Mahilpur
Residential Address with Pin Code		
Contact no	8284072216	8284072216
E-mail	vikrant.ran47@gmail.com	vikrant.ran47@gmail.com
Name	5.Mr. Rajesh Kumar	5.Mr. Rajesh Kumar
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	JCDAV College Dasuya	JCDAV College Dasuya
Residential Address with Pin Code		
Contact no	9876133458	9876133458
E-mail	rajk.chem80@gmail.com	rajk.chem80@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **esresidential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry) (Sem I)

Course Title: Organic Reaction Mechanism -I (Theory) Course Code: MCHL-1082

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Roopa	1. Dr. Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr. Rakesh kumar	2. Dr. Rakesh kumar
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	7349564686	7349564686
E-mail	rakeshkumar@nitj.ac.in	rakeshkumar@nitj.ac.in
Name	3.Dr. Meenu	3.Dr. Meenu
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda
Residential Address with Pin Code		
Contact no	9872728259	9872728259
E-mail	meenu.chem@gmail.com	meenu.chem@gmail.com
Name	4. Dr. J. Nagendra Babu	4.Dr. J. Nagendra Babu
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Chemical Sciences, Central University of Punjab, Bathinda	Department of Chemical Sciences, Central University of Punjab, Bathinda
Residential Address with Pin Code		
Contact no	9915598259	9915598259
E-mail	nagendra.rd@gmail.com	nagendra.rd@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry) (Sem I)

Course Title: Physical Chemistry – Thermodynamics (Theory) Course Code: MCHL-1083

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1..Dr. Vickramjeet Singh	1.Dr. Vickramjeet Singh
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	62838-59419	62838-59419
E-mail	singhvj@nitj.ac.in	singhvj@nitj.ac.in
Name	2.Dr. Poonam Patyal	2.Dr. Poonam Patyal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Chemistry Punjabi University, Patiala	Department of Chemistry Punjabi University, Patiala
Residential Address with Pin Code		
Contact no	8283832999	8283832999
E-mail	poonam_chem@yahoo.co.in	poonam_chem@yahoo.co.in
Name	3. Dr. Geeta Jallan	3. Dr. Geeta Jallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	4.Mr.Vikrant Singh Rana	4.Mr.Vikrant Singh Rana
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College, Mahilpur	SGGS Khalsa College ,Mahilpur
Residential Address with Pin Code		
Contact no	8284072216	8284072216
E-mail	vikrant.ran47@gmail.com	vikrant.ran47@gmail.com
Name	5.Dr. Meenu	5.Dr Meenu
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda
Residential Address with Pin Code		
Contact no	9872728259	9872728259
E-mail	meenu.chem@gmail.com	meenu.chem@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry) (Sem I)

Course Title: Spectroscopy A: Techniques for Structure Elucidation of Organic Compounds (Theory)

Course Code: MCHL-1084

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Roopa	1. Dr. Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2.Dr. Monika Bansal	2.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Name	3.Dr. J. Nagendra Babu	3.Dr. J. Nagendra Babu
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Chemical Sciences, Central University of Punjab, Bathinda	Department of Chemical Sciences, Central University of Punjab, Bathinda
Residential Address with Pin Code		
Contact no	9915598259	9915598259
E-mail	nagendra.rd@gmail.com	nagendra.rd@gmail.com
Name	4.Dr. Vipin Kumar	4.Dr. Vipin Kumar
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department Of Chemistry,G.N.D.U Amritsar	Department Of Chemistry,G.N.D.U Amritsar
Residential Address with Pin Code		
Contact no	8146300146	8146300146
E-mail	vipanorg@gmail.com	vipanorg@gmail.com
Name	5.Mr. Rohit Puri	5.Mr. Rohit Puri
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College Mehalpur	SGGS Khalsa College Mehalpur
Residential Address with Pin Code		
Contact no	9876056265	9876056265
E-mail	rpuri1979@gmail.com	rpuri1979@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Session: 2024-25

List of Practical Examiners

Department: Chemistry Programme: Master of Science (Chemistry) (Sem I)
Course Title: Inorganic Chemistry Practical (Quantitative Analysis)
Course Code: MCHP-1086

	Practical Examiner
Name	1.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	89681-55223
E-mail	bhardwajvk@nitj.ac.in
Name	2. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com
Name	3.Dr. Sadika Khullar
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	8054628675
E-mail	khullars@nitj.ac.in

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____

E-mailID:_____Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: M.Sc. (Chemistry) (Sem I)
Course Title: Organic Chemistry Practical Course Code: MCHP-1087

	Practical Examiner
Name	1. Mrs Paramjit kaur
Designation	Associate Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	98766-13109
E-mail	Paramjagbir2@gmail.com
Name	2. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com
Name	3.Dr. Roopa
Designation	Asst. Professor
Name of Department and Institute with Pin Code	IKGPTU, Kapurthala
Contact no	8427777344
E-mail	roopa_noel@yahoo.co.in

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions 3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry) (Sem II)
Course Title: Organometallics Chemistry Course Code: MCHL-2081

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Vimal Kumar Bhardwaj	1. Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	89681-55223	89681-55223
E-mail	bhardwajvk@nitj.ac.in	bhardwajvk@nitj.ac.in
Name	2. Dr. Sangeeta Oberoi	2. Dr. Sangeeta Oberoi
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	88378-97062	88378-97062
E-mail	oberois@nitj.ac.in	oberois@nitj.ac.in
Name	3. Mr. Rohit Puri	3. Mr. Rohit Puri
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College Mehalpur	SGGS Khalsa College Mehalpur
Residential Address with Pin Code		
Contact no	98760-56265	98760-56265
E-mail	rpuri1979@gmail.com	rpuri1979@gmail.com
Name	4. Dr. Geeta Hundal	4. Dr. Geeta Hundal
Designation	Professor	Professor
Name of Department and Institute with Pin Code	Department of Chemistry, Guru Nanak Dev University, Amritsar	Department of Chemistry, Guru Nanak Dev University, Amritsar
Residential Address with Pin Code		
Contact no	98882-32610	98882-32610
E-mail	geetahundal@yahoo.com	geetahundal@yahoo.com
Name	5. Dr. Rupy Dhir	5. Dr. Rupy Dhir
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Chemistry Department, GSSDGS Khalsa College, Patiala	Chemistry Department, GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	9465208678	9465208678
E-mail	rupydhir431@yahoo.com	rupydhir431@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mailID: _____
Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry)(Sem II)

Course Title: Organic Reaction Mechanism-II Course Code: MCHL-2082

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Manoj Sharma	1. Dr. Manoj Sharma
Designation	Professor	Professor
Name of Department and Institute with Pin Code	Department of Chemistry, Guru Nanak Dev University, Amritsar	Department of Chemistry, Guru Nanak Dev University, Amritsar
Residential Address		
Contact no	94176-27758	94176-27758
E-mail	mksharmaa@yahoo.co.in	mksharmaa@yahoo.co.in
Name	2. Dr. Rakesh kumar	2. Dr. Rakesh kumar
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	7349564686	7349564686
E-mail	rakeshkumar@nitj.ac.in	rakeshkumar@nitj.ac.in
Name	3.Dr. J. Nagendra Babu	3.Dr. J. Nagendra Babu
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Chemical Sciences, Central University of Punjab, Bathinda	Department of Chemical Sciences, Central University of Punjab, Bathinda
Residential Address with Pin Code		
Contact no	9915598259	9915598259
E-mail	nagendra.rd@gmail.com	nagendra.rd@gmail.com
Name	4. Dr. Jaspreet Kaur	4. Dr. Jaspreet Kaur
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	94646-20971	94646-20971
E-mail	rajputj@nitj.ac.in	rajputj@nitj.ac.in
Name	5.Dr. Meenu	3.Dr. Meenu
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda
Residential Address with Pin Code		
Contact no	9872728259	9872728259
E-mail	meenu.chem@gmail.com	meenu.chem@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**. 3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry)(Sem II)

Course Title: Physical Chemistry-Quantum Chemistry Course Code: MCHL-2083

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1..Dr. Vickramjeet Singh	1.Dr. Vickramjeet Singh
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	62838-59419	62838-59419
E-mail	singhvj@nitj.ac.in	singhvj@nitj.ac.in
Name	2.Dr. Vimal Kumar Bhardwaj	2.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	89681-55223	89681-55223
E-mail	bhardwajvk@nitj.ac.in	bhardwajvk@nitj.ac.in
Name	3.Dr. Sangeeta Sharma	3.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	4.Mr. Vikrant Rana	4.Mr.Vikrant Rana
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College, Mahilpur	SGGS Khalsa College, Mahilpur
Residential Address with Pin Code		
Contact no	8284072216	8284072216
E-mail	vikrant.ran47@gmail.com	vikrant.ran47@gmail.com
Name	5.Mr. Rajesh Kumar	5.Mr. Rajesh Kumar
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	JCDAV College Dasuya	JCDAV College Dasuya
Residential Address with Pin Code		
Contact no	9876133458	9876133458
E-mail	rajk.chem80@gmail.com	rajk.chem80@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.

2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.

3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry)(Sem II)

Course Title: Reaction Mechanisms and Metal Clusters Course Code: MCHL-2084

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Vimal Kumar Bhardwaj	1.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	89681-55223	89681-55223
E-mail	bhardwajvk@nitj.ac.in	bhardwajvk@nitj.ac.in
Name	2.Dr. Sangeeta Oberoi	2.Dr. Sangeeta Oberoi
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	88378-97062	88378-97062
E-mail	oberois@nitj.ac.in	oberois@nitj.ac.in
Name	3.Mr. Rohit Puri	3.Mr. Rohit Puri
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College Mehalpur	SGGS Khalsa College Mehalpur
Residential Address with Pin Code		
Contact no	98760-56265	98760-56265
E-mail	rpuri1979@gmail.com	rpuri1979@gmail.com
Name	4.Dr. Meenu	4.Dr Meenu
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda
Residential Address with Pin Code		
Contact no	9872728259	9872728259
E-mail	meenu.chem@gmail.com	meenu.chem@gmail.com
Name	5. Dr. Rupy Dhir	5. Dr. Rupy Dhir
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Chemistry Department, GSSDGS Khalsa College, Patiala	Chemistry Department, GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	9465208678	9465208678
E-mail	rupydhir431@yahoo.com	rupydhir431@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____

__E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ In charges of Vocational Programme

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry) (Sem II)

Course Title: Spectroscopy B: Techniques for Structure Elucidation of Inorganic Compounds

Course Code: MCHL-2085

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Vimal Kumar Bhardwaj	1. Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	89681-55223	89681-55223
E-mail	bhardwajvk@nitj.ac.in	bhardwajvk@nitj.ac.in
Name	2. Dr. Sangeeta Oberoi	2. Dr. Sangeeta Oberoi
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	88378-97062	88378-97062
E-mail	oberois@nitj.ac.in	oberois@nitj.ac.in
Name	3. Mr. Rohit Puri	3. Mr. Rohit Puri
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College Mehalpur	SGGS Khalsa College Mehalpur
Residential Address with Pin Code		
Contact no	98760-56265	98760-56265
E-mail	rpuri1979@gmail.com	rpuri1979@gmail.com
Name	4.Dr. Meenu	4.Dr Meenu
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda
Residential Address with Pin Code		
Contact no	9872728259	9872728259
E-mail	meenu.chem@gmail.com	meenu.chem@gmail.com
Name	5. Dr. Rupy Dhir	5. Dr. Rupy Dhir
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Chemistry Department, GSSDGS Khalsa College, Patiala	Chemistry Department, GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	9465208678	9465208678
E-mail	rupydhir431@yahoo.com	rupydhir431@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar(Autonomous)

List of Practical Examiners

Session: 2024-25

Department: Chemistry Programme: Master of Science (Chemistry) (Sem II)

Course Title: Organic Chemistry Practical Course Code: MCHP-2087

	Practical Examiner
Name	1. Dr. Rakesh kumar
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	7349564686
E-mail	rakeshkumar@nitj.ac.in
Name	2. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com
Name	3.Dr. Sadika Khullar
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	8054628675
E-mail	khullars@nitj.ac.in

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.

2.The paper setter/ Evaluator should possesss **5 years** teaching experience in affiliated institutions

3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.

4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Master of Science (Chemistry) (Sem II)

Course Title: Physical Chemistry Practical Practical Course Code: MCHP-2088

	Practical Examiner
Name	1.Dr. Vickramjeet Singh
Designation	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar
Contact no	62838-59419
E-mail	singhvj@nitj.ac.in
Name	2.Dr. Sadika Khullar
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	8054628675
E-mail	khullars@nitj.ac.in
Name	3. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes:

_____ E-mail ID:

_____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: M.Sc. (Chemistry)(Sem III)
Course Title: Inorganic Chemistry-II (Theory) Course Code: MCHL-3081

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Vimal Kumar Bhardwaj	1.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	89681-55223	89681-55223
E-mail	bhardwajvk@nitj.ac.in	bhardwajvk@nitj.ac.in
Name	2.Ms. Pooja Bedi	2.Ms. Pooja Bedi
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College, Mahilpur	SGGS Khalsa College, Mahilpur
Residential Address with Pin Code	520 Karol Bagh, Jalandhar	520 Karol Bagh, Jalandhar
Contact no	7986144285	7986144285
E-mail	poojabedi1807@gmail.com	poojabedi1807@gmail.com
Name	3.Dr. Sangeeta Sharma	3.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	4.Mr. Vikrant Rana	4.Mr.Vikrant Rana
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College, Mahilpur	SGGS Khalsa College, Mahilpur
Residential Address with Pin Code		
Contact no	8284072216	8284072216
E-mail	vikrant.ran47@gmail.com	vikrant.ran47@gmail.com
Name	5.Mr. Rajesh Kumar	5.Mr. Rajesh Kumar
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	JCDAV College Dasuya	JCDAV College Dasuya
Residential Address with Pin Code		
Contact no	9876133458	9876133458
E-mail	rajk.chem80@gmail.com	rajk.chem80@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

KanyaMahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: M.Sc. (Chemistry) (Sem III)

Course Title: Organic Synthesis (Theory) Course Code: MCHL-3082

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Roopa	1. Dr. Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2.Ms Pooja Bedi	2.Ms Pooja Bedi
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College, Mahilpur	SGGS Khalsa College, Mahilpur
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Contact no	7986144285	7986144285
E-mail	poojabedi1807@gmail.com	poojabedi1807@gmail.com
Name	3.Dr. Rakesh kumar	3. Dr. Rakesh kumar
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	7349564686	7349564686
E-mail	rakeshkumar@nitj.ac.in	rakeshkumar@nitj.ac.in
Name	4. Dr. J. Nagendra Babu	4.Dr. J. Nagendra Babu
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Chemical Sciences, Central University of Punjab, Bathinda	Department of Chemical Sciences, Central University of Punjab, Bathinda
Residential Address with Pin Code		
Contact no	9915598259	9915598259
E-mail	nagendra.rd@gmail.com	nagendra.rd@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: M.Sc. (Chemistry) (Sem III)

Course Title: Surface and Polymer Chemistry (Theory) Course Code: MCHL-3083

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Harsh Manchanda	1. Dr. Harsh Manchanda
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	9876498660	9876498660
E-mail	manchandah@nitj.ac.in	manchandah@nitj.ac.in
Name	2.Dr. Poonam Patyal	2.Dr. Poonam Patyal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Chemistry Punjabi University, Patiala	Department of Chemistry Punjabi University, Patiala
Residential Address with Pin Code		
Contact no	8283832999	8283832999
E-mail	poonam_chem@yahoo.co.in	poonam_chem@yahoo.co.in
Name	3. Dr. Geeta Jallan	3. Dr. Geeta Jallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	4.Mr.Vikrant Singh Rana	4.Mr.Vikrant Singh Rana
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College, Mahilpur	SGGS Khalsa College ,Mahilpur
Residential Address with Pin Code		
Contact no	8284072216	8284072216
E-mail	vikrant.ran47@gmail.com	vikrant.ran47@gmail.com
Name	5.Dr. Meenu	5.Dr Meenu
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda	Department of Applied Chemistry, Maharaja Ranjit Singh PTU, Bathinda
Residential Address with Pin Code		
Contact no	9872728259	9872728259
E-mail	meenu.chem@gmail.com	meenu.chem@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: M.Sc. (Chemistry)(Sem III)

Course Title: Photochemistry and Pericyclic Reaction (Theory) Course Code: MCHL-3084

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Rishu Jain	1.Dr. Rishu Jain
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dept. of Chemistry, GGN Khalsa College, Ludhiana	Dept. of Chemistry, GGN Khalsa College, Ludhiana
Residential Address with Pin Code		
Contact no	7696066484	7696066484
E-mail	rshjn334@gmail.com	rshjn334@gmail.com
Name	2.Dr. Monika Bansal	2.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Name	3.Dr. J. Nagendra Babu	3.Dr. J. Nagendra Babu
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Chemical Sciences, Central University of Punjab, Bathinda	Department of Chemical Sciences, Central University of Punjab, Bathinda
Residential Address with Pin Code		
Contact no	9915598259	9915598259
E-mail	nagendra.rd@gmail.com	nagendra.rd@gmail.com
Name	4.Dr. Vipin Kumar	4.Dr. Vipin Kumar
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department Of Chemistry, G.N.D.U Amritsar	Department Of Chemistry, G.N.D.U Amritsar
Residential Address with Pin Code		
Contact no	8146300146	8146300146
E-mail	vipanorg@gmail.com	vipanorg@gmail.com
Name	5.Mr. Rohit Puri	5.Mr. Rohit Puri
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College Mahilpur	SGGS Khalsa College Mahilpur
Residential Address with Pin Code		
Contact no	9876056265	9876056265
E-mail	rpuri1979@gmail.com	rpuri1979@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**. 3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: M.Sc. (Chemistry) (Sem III)

Course Title: Inorganic Chemistry Practical (Preparations) Course Code: MCHP-3085

	Practical Examiner
Name	1.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	89681-55223
E-mail	bhardwajvk@nitj.ac.in
Name	2. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja0283@yahoo.com
Name	3.Dr. Sadika Khullar
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	8054628675
E-mail	khullars@nitj.ac.in

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: M.Sc. (Chemistry) (Sem III)

Course Title: Physical Chemistry Practical Course Code: MCHP-3086

	Practical Examiner
Name	1.Dr. Vickramjeet Singh
Designation	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar
Contact no	62838-59419
E-mail	singhvj@nitj.ac.in
Name	2. Dr. Harsh Manchanda
Designation	Associate Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar
Contact no	98764-98660
E-mail	manchandah@nitj.ac.in
Name	3. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry)(Sem IV)

Course Title: Advanced Inorganic Chemistry (Theory) Course Code: MCHL-4081

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Geeta Jallan	1. Dr. Geeta Jallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	2.Dr Meenu	2.Dr Meenu
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Applied Chemistry,Maharaja Ranjit Singh PTU,Bathinda	Department of Applied Chemistry,Maharaja Ranjit Singh PTU,Bathinda
Residential Address with Pin Code		
Contact no	9872728259	9872728259
E-mail	meenu.chem@gmail.com	meenu.chem@gmail.com
Name	3.Dr Sangeeta Sharma	3.Dr Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Shaheed Bhagat Singh State Technical Campus,Ferozpur	Shaheed Bhagat Singh State Technical Campus,Ferozpur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70@yahoo.co.in	ssharma70@yahoo.co.in
Name	4.Dr. Vimal Kumar Bhardwaj	4.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	89681-55223	89681-55223
E-mail	bhardwajvk@nitj.ac.in	bhardwajvk@nitj.ac.in
Name	5.Mr. Rohit Puri	5.Mr. Rohit Puri
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	SGGS Khalsa College Mehalpur	SGGS Khalsa College Mehalpur
Residential Address with Pin Code		
Contact no	98760-56265	98760-56265
E-mail	rpuri1979@gmail.com	rpuri1979@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Master of Science (Chemistry)(Sem IV)

Course Title: Chemistry Of Natural Products (Theory) Course Code: MCHL-4082

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr.Uma Shanker	1.Dr.Uma Shanker
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar	Dr B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	7837588168	7837588168
E-mail	shankeru@nitj.ac.in	shankeru@nitj.ac.in
Name	2.Dr. J. Nagendra Babu	2.Dr. J. Nagendra Babu
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Chemical Sciences, Central University of Punjab, Bathinda	Department of Chemical Sciences, Central University of Punjab, Bathinda
Residential Address with Pin Code		
Contact no	9915598259	9915598259
E-mail	nagendra.rd@gmail.com	nagendra.rd@gmail.com
Name	3. Dr. Rakesh kumar	3. Dr. Rakesh kumar
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Residential Address with Pin Code		
Contact no	7349564686	7349564686
E-mail	rakeshkumar@nitj.ac.in	rakeshkumar@nitj.ac.in
Name	4.Dr. Manpreet Kaur	4.Dr. Manpreet Kaur
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Chemistry PAU, Ludhiana	Department of Chemistry PAU, Ludhiana
Residential Address with Pin Code		
Contact no	8146200711	8146200711
E-mail	manpreetchem@pau.edu	manpreetchem@pau.edu
Name	5. Dr. Pooja Dhir	5. Dr. Pooja Dhir
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar	PG Department of Chemistry, DAV College, Jalandhar
Residential Address with Pin Code		
Contact no	90410-51100	90410-51100
E-mail	pooja02_83@yahoo.com	pooja02_83@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: M.Sc (Chemistry) (Sem IV)

Course Title: Electrochemistry and Chemical Dynamics (Theory) Course Code: MCHL-4083

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Sangeeta Sharma	1.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	2. Dr. Harsh Manchanda	2. Dr. Harsh Manchanda
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	Department of Chemistry, NIT, Jalandhar	Department of Chemistry, NIT, Jalandhar
Residential Address with Pin Code		
Contact no	9876498660	9876498660
E-mail	manchandah@nitj.co.in	manchandah@nitj.co.in
Name	3. Dr. Geeta Jallan	3. Dr. Geeta Jallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	4.Dr.Poonam Patyal	4.Dr.Poonam Patyal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Chemistry Punjabi University, Patiala	Department of Chemistry Punjabi University, Patiala
Residential Address with Pin Code		
Contact no	8283832999	8283832999
E-mail	poonam_chem@yahoo.co.in	poonam_chem@yahoo.co.in
Name	5.Dr. Manpreet Kaur	5.Dr. Manpreet Kaur
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Department of Chemistry PAU, Ludhiana	Department of Chemistry PAU, Ludhiana
Residential Address with Pin Code		
Contact no	8146200711	8146200711
E-mail	manpreetchem@pau.edu	manpreetchem@pau.edu

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
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Kanya Maha Vidyalaya, Jalandhar(Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Master of Science (Chemistry) (Sem IV)

Course Title: Advanced Practical- Organic Synthesis Course Code: MCHP-4084

	Practical Examiner
Name	1. Mrs Paramjit kaur
Designation	Associate Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	98766-13109
E-mail	Paramjagbir2@gmail.com
Name	2. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com
Name	3.Dr. Roopa
Designation	Asst. Professor
Name of Department and Institute with Pin Code	IKGPTU, Kapurthala
Contact no	8427777344
E-mail	roopa_noel@yahoo.co.in

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Master of Science (Chemistry) (Sem IV)

Course Title: Advanced Practicals- Inorganic Synthesis Course Code: MCHP-4085

	Practical Examiner
Name	1.Dr. Vimal Kumar Bhardwaj
Designation	Assistant Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	89681-55223
E-mail	bhardwajvk@nitj.ac.in
Name	2. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com
Name	3.Dr. Sadika Khullar
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	8054628675
E-mail	khullars@nitj.ac.in

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya MahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Master of Science (Chemistry) (Sem IV)

Course Title: Advanced Practical- Physical Chemistry Course Code: MCHP-4086

	Practical Examiner
Name	1.Dr. Vickramjeet Singh
Designation	Assistant Professor
Name of Department and Institute with Pin Code	Dr B R Ambedkar National Institute of Technology, Jalandhar
Contact no	62838-59419
E-mail	singhvj@nitj.ac.in
Name	2. Dr. Harsh Manchanda
Designation	Associate Professor
Name of Department and Institute with Pin Code	Dr. B R Ambedkar National Institute of Technology, Jalandhar
Contact no	98764-98660
E-mail	manchandah@nitj.ac.in
Name	3. Dr. Pooja Dhir
Designation	Assistant Professor
Name of Department and Institute with Pin Code	PG Department of Chemistry, DAV College, Jalandhar
Contact no	90410-51100
E-mail	pooja02_83@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____

E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Sem III)

Course Title: Chemistry(Organic Chemistry) (Theory) Course Code: BSMM/BSNM-3084(I)

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr.Roopa	1. Dr.Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr.AmarjitKaur	2. Dr.AmarjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Hoshiarpur	Govt. College, Hoshiarpur
Residential Address with Pin Code		
Contact no	9463905804	9463905804
E-mail	amarjit_kaur70@yahoo.com	amarjit_kaur70@yahoo.com
Name	3. Ms.Meenakshi Bhanot	3. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	4.Dr.Paramjit Kaur	4.Dr.Paramjit Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurthala	BebeNanki University College, Mithra, Kapurthala
Residential Address with Pin Code		
Contact no	814627202	814627202
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Sem III)

Course Title: Chemistry (Physical Chemistry) (Theory) Course Code: BSMM/BSNM-3084(II)

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Geeta Jallan	1.Dr. Geeta Jallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	2.Dr. Monika Bansal	2.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Name	3. Mr. Rajesh Mittu	3. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com
Name	4. Ms. Rajwinder Kaur	4. Ms. Rajwinder Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	Ramgarhia College, Phagwara	Ramgarhia College, Phagwara
Residential Address with Pin Code		
Contact no	98555-93331	98555-93331
E-mail	rajchemdept@gmail.com	rajchemdept@gmail.com
Name	5. Dr. Paramjit Kaur	5. Dr. Paramjit Kaur
Designation	Ass. Professor	Ass. Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Sem III)

Course Title: Chemistry (Practical**)** Course Code: BSMM/BSNM-3084(P)

	Practical Examiner
Name	1.Mr. Kuldeep Yadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Dr. Rajinder Kaur
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	9872025130
E-mail	rajinderkaur2412@gmail.com
Name	3. Mrs. Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D. Arya College, JRC-144005
Contact no	9814677064
E-mail	mkhosla48@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

KanyaMahaVidyalaya, Jalandhar(Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Sem IV)

Course Title:Chemistry(Inorganic Chemistry) (Theory) Course Code: BSMM/BSNM-4084(I)

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Ms.MeenakshiBhanot	1. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	2. Mr. Ravi Sharma	2. Mr. Ravi Sharma
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9501035918	9501035918
E-mail	ravi.dav1923@gmail.com	ravi.dav1923@gmail.com
Name	3. Dr.ParamjitKaur	3. Dr.ParamjitKaur
Designation	Ass. Professor	Ass. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurtala	BebeNanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	4.Dr. Sangeeta Sharma	4.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, ShaheedBhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, ShaheedBhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	5. Mr. Rajesh Mittu	5. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
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Kanya Maha Vidyalaya, Jalandhar(Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Sem IV)

Course Title: Chemistry(Organic Chemistry)(Theory) Course Code: BSMM/BSNM-4084(II)

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr.Roopa	1. Dr.Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr.AmarjitKaur	2. Dr.AmarjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Hoshiarpur	Govt. College, Hoshiarpur
Residential Address with Pin Code		
Contact no	9463905804	9463905804
E-mail	amarjit_kaur70@yahoo.com	amarjit_kaur70@yahoo.com
Name	3. Ms.Meenakshi Bhanot	3. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	4.Dr.Paramjit Kaur	4.Dr.Paramjit Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurthala	BebeNanki University College, Mithra, Kapurthala
Residential Address with Pin Code		
Contact no	814627202	814627202
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
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KanyaMahaVidyalaya, Jalandhar(Autonomous)
Session: 2024-25

List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Sem IV)

Course Title: Chemistry (Practical**)** Course Code: BSMM/BSNM-4084(P)

	Practical Examiner
Name	1 Mr.KuldeepYadav
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3.Mrs.Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D Arya College for Women , Jalandhar Cantt.
Contact no	9814677064
E-mail	mkhosla48@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
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Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Sem IV)

Course Title: Chemistry (Practical**)** Course Code: BSMM/BSNM-4084(P)

	Practical Examiner
Name	1 Mr.KuldeepYadav
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3.Dr. JaspreetKaur Bhatia
Designation	Assistant Professor
Name of Department and Institute with Pin Code	DAV, Jalandhar
Contact no	9356661947
E-mail	jaspreetbhatia81@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss**5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme Bachelor of Science (Sem V)

Course Title: Chemistry (Inorganic Chemistry) (Theory) Course Code: BSMM/BSNM-5084(I)

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Rupy Dhir	1. Dr. Rupy Dhir
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Chemistry Department, GSSDGS Khalsa College, Patiala	Chemistry Department, GSSDGS Khalsa College, Patiala
Residential Address with Pin Code		
Contact no	9465208678	9465208678
E-mail	rupydhir431@yahoo.com	rupydhir431@yahoo.com
Name	2. Mr. Ravi Sharma	2. Mr. Ravi Sharma
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9501035918	9501035918
E-mail	ravi.dav1923@gmail.com	ravi.dav1923@gmail.com
Name	3. Dr. Paramjit Kaur	3. Dr. Paramjit Kaur
Designation	Ass. Professor	Ass.Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	4.Dr. Sangeeta Sharma	4.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	5. Mr. Rajesh Mittu	5. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Sem V)

Course Title: Physical Chemistry (Theory) Course Code: BSMM/BSNM-5084(II)

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1.Dr. Geeta Jallan	1.Dr. Geeta Jallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	2.Dr. Monika Bansal	2.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Name	3. Mr. Rajesh Mittu	3. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com
Name	4. Ms. Rajwinder Kaur	4. Ms. Rajwinder Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	Ramgarhia College, Phagwara	Ramgarhia College, Phagwara
Residential Address with Pin Code		
Contact no	98555-93331	98555-93331
E-mail	rajchemdept@gmail.com	rajchemdept@gmail.com
Name	5. Dr. Paramjit Kaur	5. Dr.Paramjit Kaur
Designation	Ass. Professor	Ass. Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Sem V)

Course Title: Chemistry (Practical**)** Course Code: BSMM/BSNM-5084(P)

	Practical Examiner
Name	1.Mr. Kuldeep Yadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso. Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3. Mrs. Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D. Arya College, JRC-144005
Contact no	9814677064
E-mail	mkhosla48@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/Evaluators

Department: Chemistry Programme: Bachelor of Science (Sem VI)

Course Title: Chemistry(Molecular Spectroscopy) (Theory) Course Code: BSMM/BSNM-6084(I)

Tick the language/s in which question paper is to be set: English √ Punjabi Hindi

	Paper Setter	**Evaluator**
Name	1. Dr.Roopa	1. Dr.Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr.AmarjitKaur	2. Dr.AmarjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Hoshiarpur	Govt. College, Hoshiarpur
Residential Address with Pin Code		
Contact no	9463905804	9463905804
E-mail	amarjit_kaur70@yahoo.com	amarjit_kaur70@yahoo.com
Name	3. Ms.Meenakshi Bhanot	3. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	4.Dr.Paramjit Kaur	4.Dr.Paramjit Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurthala	BebeNanki University College, Mithra, Kapurthala
Residential Address with Pin Code		
Contact no	814627202	814627202
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

Kanya MahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Sem VI)

Course Title: Chemistry(Physical Chemistry) (Theory) Course Code: BSMM/BSNM-6084(II)

Tick the language/s in which question paper is to be set: English √ Punjabi Hindi

	Paper Setter	**Evaluator**
Name	1. Dr.GeetaJallan	1. Dr.GeetaJallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	2.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Name	3. Mr. Rajesh Mittu	3. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com
Name	4.Ms. RajwinderKaur	4.Ms.RajwinderKaur
Designation	Asso. Professor.	Asso.Professor
Name of Department and Institute with Pin Code	Ramgarhia College, Phagwara	Ramgarhia College, Phagwara
Residential Address with Pin Code		
Contact no	98555-93331	98555-93331
E-mail	rajchemdept@gmail.com	rajchemdept@gmail.com
Name	5. Dr.ParamjitKaur	5. Dr.ParamjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurtala	BebeNanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____

E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Sem VI)

Course Title: Chemistry (Practical**)** Course Code: BSMM/BSNM-6084(P)

	Practical Examiner
Name	1 Mr.KuldeepYadav
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3.Mrs.Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D Arya College for Women , Jalandhar Cantt.
Contact no	9814677064
E-mail	mkhosla48@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss**5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Biotechnology)Sem-I

Course Title: Chemistry-I (Theory) Course Code: BBTL-1087

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Roopa	1. Dr. Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Mr. Ravi Sharma	2. Mr. Ravi Sharma
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9501035918	9501035918
E-mail	ravi.dav1923@gmail.com	ravi.dav1923@gmail.com
Name	3. Dr. Paramjit Kaur	3. Dr.Paramjit Kaur
Designation	Ass. Professor	Ass.Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	4.Dr. Sangeeta Sharma	4.Dr. Sangeeta Sharma
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur	Department of Applied Sciences, Shaheed Bhagat Singh State Technical Campus, Ferozepur
Residential Address with Pin Code		
Contact no	9888569566	9888569566
E-mail	ssharma70in@yahoo.co.in	ssharma70in@yahoo.co.in
Name	5. Mr. Rajesh Mittu	5. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____
E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Biotechnology)Sem-I

Course Title: Lab in Chemistry-I (Practical) Course Code: BBTP-1082

	Practical Examiner
Name	1. Mr. Kuldeep Yadav
Designation	Asso. Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	3.Dr. Rajinder Kaur
Designation	Asst. Professor
Name of Department and Institute with Pin Code	Doaba College, Jalandhar
Contact no	9872025130
E-mail	rajinderkaur2412@gmail.com
Name	3.Mrs.Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D Arya College , Jalandhar Cantt.
Contact no	9814677064
E-mail	mkhosla48@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possess **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Biotechnology) Semester-III

Course Title: Chemistry-II(Theory) Course Code: BBTM-3083

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr.Roopa	1. Dr.Roopa
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Dept. of Chemical Sciences, IKGPTU, Kapurthala	Dept. of Chemical Sciences, IKGPTU, Kapurthala
Residential Address with Pin Code		
Contact no	8427777344	8427777344
E-mail	roopa_noel@yahoo.co.in	roopa_noel@yahoo.co.in
Name	2. Dr.AmarjitKaur	2. Dr.AmarjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Hoshiarpur	Govt. College, Hoshiarpur
Residential Address with Pin Code		
Contact no	9463905804	9463905804
E-mail	amarjit_kaur70@yahoo.com	amarjit_kaur70@yahoo.com
Name	3. Ms.Meenakshi Bhanot	3. Ms.MeenakshiBhanot
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	Govt. College, Gurdaspur	Govt. College, Gurdaspur
Residential Address with Pin Code		
Contact no	9876054525	9876054525
E-mail	msharma712@gmail.com	msharma712@gmail.com
Name	4.Dr.Paramjit Kaur	4.Dr.Paramjit Kaur
Designation	Asso. Professor	Asso. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurthala	BebeNanki University College, Mithra, Kapurthala
Residential Address with Pin Code		
Contact no	814627202	814627202
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.

2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

Session: 2024-25

List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Biotechnology) Semester-III

Course Title: Chemistry-II(Practical) Course Code: BBTM-3083(P)

	Practical Examiner
Name	1 Mr.KuldeepYadav
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3.Mrs.Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D Arya College for Women , Jalandhar Cantt.
Contact no	9814677064
E-mail	mkhosla48@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: **Note**: 1. Practical Examiners must be from **Local Colleges**.

2.The paper setter/ Evaluator should possesss**5 years** teaching experience in affiliated institutions

3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.

4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya MahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Bio-Technology) (Sem VI)

Course Title: Chemistry-III Course Code: BBTM-6085

Tick the language/s in which question paper is to be set: English √ Punjabi Hindi

	Paper Setter	**Evaluator**
Name	1. Dr.GeetaJallan	1. Dr.GeetaJallan
Designation	Associate Professor	Associate Professor
Name of Department and Institute with Pin Code	GGN Khalsa College Ludhiana	GGN Khalsa College Ludhiana
Residential Address with Pin Code		
Contact no	97799-01766	97799-01766
E-mail	geetajallan@gmail.com	geetajallan@gmail.com
Name	2.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Name	3. Mr. Rajesh Mittu	3. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com
Name	4.Ms. RajwinderKaur	4.Ms.RajwinderKaur
Designation	Asso. Professor.	Asso.Professor
Name of Department and Institute with Pin Code	Ramgarhia College, Phagwara	Ramgarhia College, Phagwara
Residential Address with Pin Code		
Contact no	98555-93331	98555-93331
E-mail	rajchemdept@gmail.com	rajchemdept@gmail.com
Name	5. Dr.ParamjitKaur	5. Dr.ParamjitKaur
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	BebeNanki University College, Mithra, Kapurtala	BebeNanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____

E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions. 2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residentialaddress must be provided.**

Kanya MahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Bio-Technology) (Sem VI)

Course Title: Chemistry-III (Practical) Course Code: BBTM-6085(P)

	Practical Examiner
Name	1 Mr.KuldeepYadav
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3.Mrs.Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D Arya College for Women , Jalandhar Cantt.
Contact no	9814677064
E-mail	mkhosla48@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss**5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)
Session: 2024-25
List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Home Science) (Sem III)
Course Title: Basic Chemistry (Theory) Course Code: BHSM-3087
Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Rummi Saini	1. Dr. Rummi Saini
Designation	Asso. Professor	Asso.Professor
Name of Department and Institute with Pin Code	SMDRSD College, Pathankot	SMDRSD College, Pathankot
Residential Address with Pin Code		
Contact no	98884-59110	98884-59110
E-mail	rumisaini@gmail.com	rumisaini@gmail.com
Name	2. Mr. Ravi Sharma	2. Mr. Ravi Sharma
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9501035918	9501035918
E-mail	ravi.dav1923@gmail.com	ravi.dav1923@gmail.com
Name	3. Mr. Rajesh Mittu	3. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com
Name	4. Dr. Paramjit Kaur	4. Dr. Paramjit Kaur
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. The paper setter/ Evaluator should possess 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
3. If the paper setter/ evaluator is a retired person, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya MahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Home Science) (Sem III)

Course Title: Applied Chemistry (Practical**)** Course Code: BHSM-3087(P)

	Practical Examiner
Name	1 Mr.KuldeepYadav
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3.Mrs.Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D Arya College for Women , Jalandhar Cantt.
Contact no	9814677064
E-mail	mkhosla48@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
2.The paper setter/ Evaluator should possesss **5 years** teaching experience in affiliated institutions
3. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

Kanya MahaVidyalaya, Jalandhar(Autonomous)
(Session: 2024-25)

List of Theory Paper Setters/ Evaluators

Department: Chemistry Programme: Bachelor of Science (Home Science)(Sem IV)

Course Title: Applied Chemistry (Theory) Course Code: BHSM-4087

Tick the language/s in which question paper is to be set: English [√] Punjabi [ ] Hindi [ ]

	Paper Setter	**Evaluator**
Name	1. Dr. Rummi Saini	1. Dr. Rummi Saini
Designation	Asso. Professor	Asso.Professor
Name of Department and Institute with Pin Code	SMDRSD College, Pathankot	SMDRSD College, Pathankot
Residential Address with Pin Code		
Contact no	98884-59110	98884-59110
E-mail	rumisaini@gmail.com	rumisaini@gmail.com
Name	2. Mr. Ravi Sharma	2. Mr. Ravi Sharma
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9501035918	9501035918
E-mail	ravi.dav1923@gmail.com	ravi.dav1923@gmail.com
Name	3. Mr. Rajesh Mittu	3. Mr. Rajesh Mittu
Designation	Asst. Professor	Asst. Professor
Name of Department and Institute with Pin Code	DAV College, Amritsar	DAV College, Amritsar
Residential Address with Pin Code		
Contact no	9463572557	9463572557
E-mail	rajeshmittu79@gmail.com	rajeshmittu79@gmail.com
Name	4. Dr. Paramjit Kaur	4. Dr. Paramjit Kaur
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	Bebe Nanki University College, Mithra, Kapurtala	Bebe Nanki University College, Mithra, Kapurtala
Residential Address with Pin Code		
Contact no	8146272020	8146272020
E-mail	param.chem10@gmail.com	param.chem10@gmail.com
Name	5.Dr. Monika Bansal	5.Dr. Monika Bansal
Designation	Assistant Professor	Assistant Professor
Name of Department and Institute with Pin Code	GSSDGS Khalsa College, Patiala	GSSDGS Khalsa College, Patiala
Residential Address with Pin Code	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com
Contact no	8872760900	8872760900
E-mail	monika_bansal79@yahoo.com	monika_bansal79@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Inchargesof Vocational Programmes

Note: 1. The paper setter/ Evaluator should possesss 5 years teaching experience in affiliated institutions.
2. He/ She should have taught the paper for which he/ she have been appointed as paper setter/ evaluator for the last **3 years**.
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Kanya MahaVidyalaya, Jalandhar (Autonomous)
Session: 2024-25

List of Practical Examiners

Department: Chemistry Programme: Bachelor of Science (Home Science) (Sem IV)

Course Title: Applied Chemistry (Practical**)** Course Code: BHSM-4087(P)

	Practical Examiner
Name	1 Mr.KuldeepYadav
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	9463281609
E-mail	k66yk@yahoo.com
Name	2.Mrs.Paramjit Kaur
Designation	Asso.Professor
Name of Department and Institute with Pin Code	DoabaCollege,Jalandhar
Contact no	98766-13109
E-mail	paramjagbir2@gmail.com
Name	3.Mrs.Monica Khosla
Designation	Assistant Professor
Name of Department and Institute with Pin Code	B.D Arya College for Women , Jalandhar Cantt.
Contact no	9814677064
E-mail	mkhosla48@yahoo.com

Name of the HoD/ Dean/ Incharges of Vocational Programmes: _____ E-mail ID: _____ Contact No. _____

Signature of HoD/ Dean/ Incharges of Vocational Programmes

Note: 1. Practical Examiners must be from **Local Colleges**.
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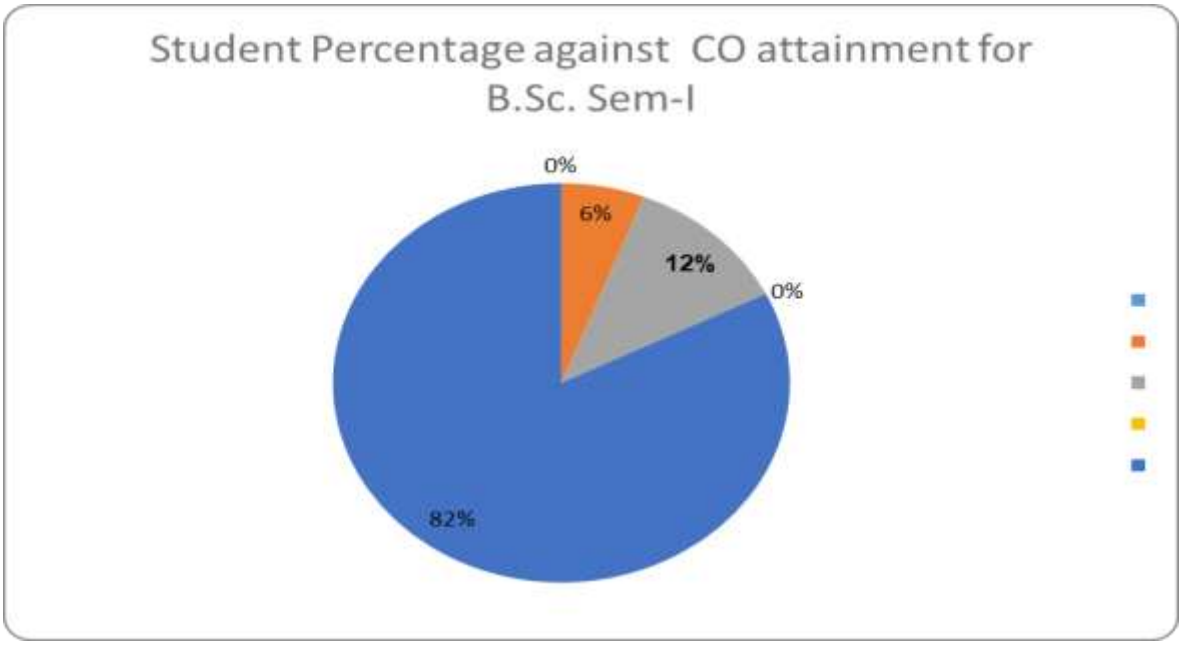
4. If the paper setter/ evaluator is a **retired person**, then his/ her age should not be above **70 years** and his/ her **residential address must be provided.**

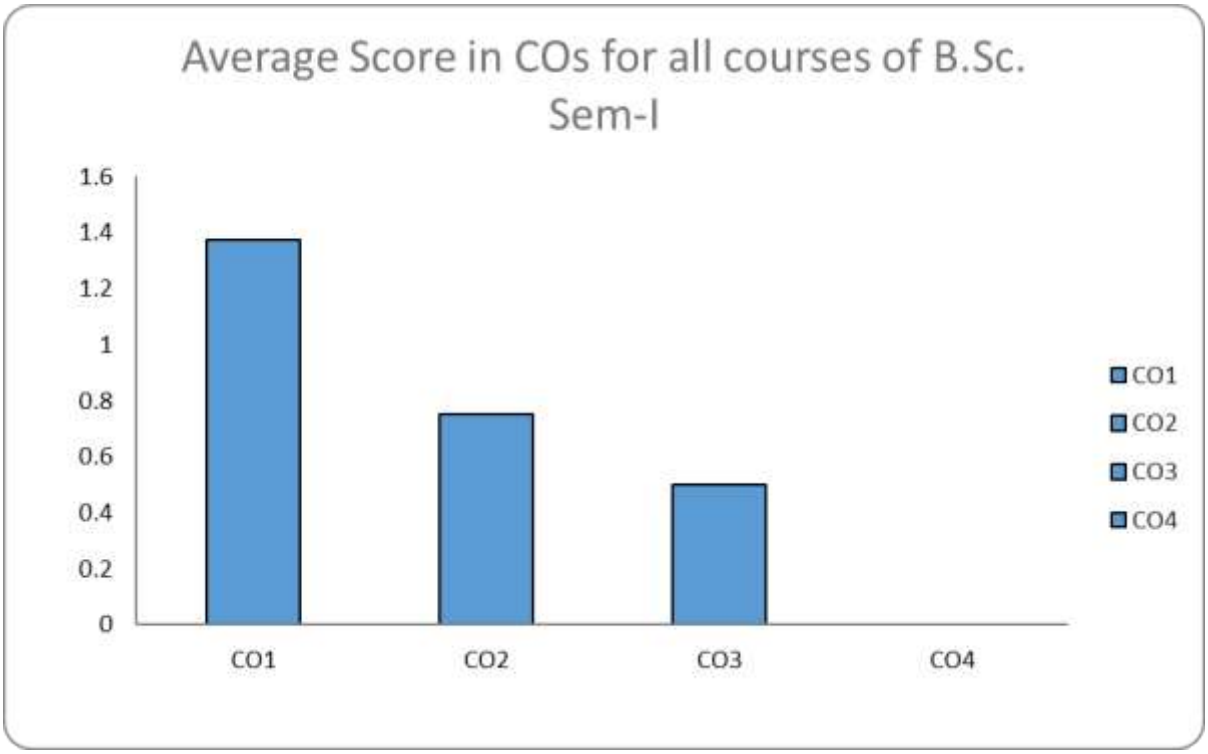
Annexure J

Course Outcomes Attainment

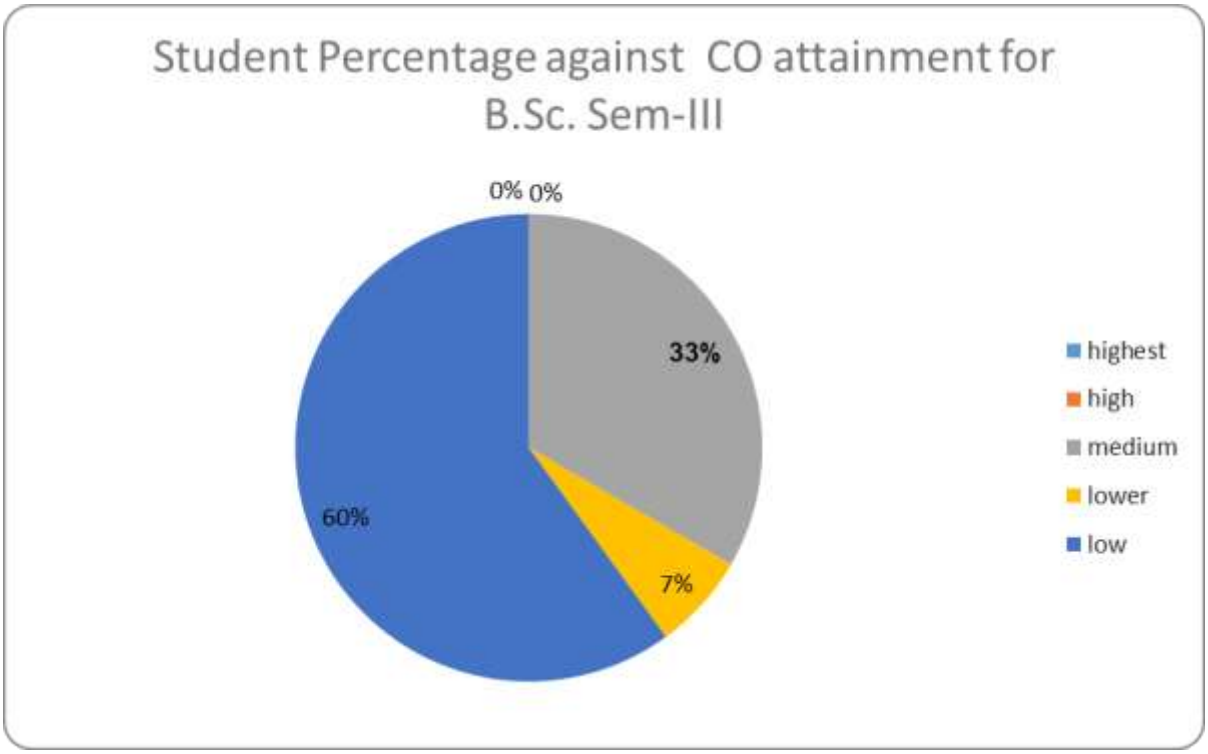
2023-24

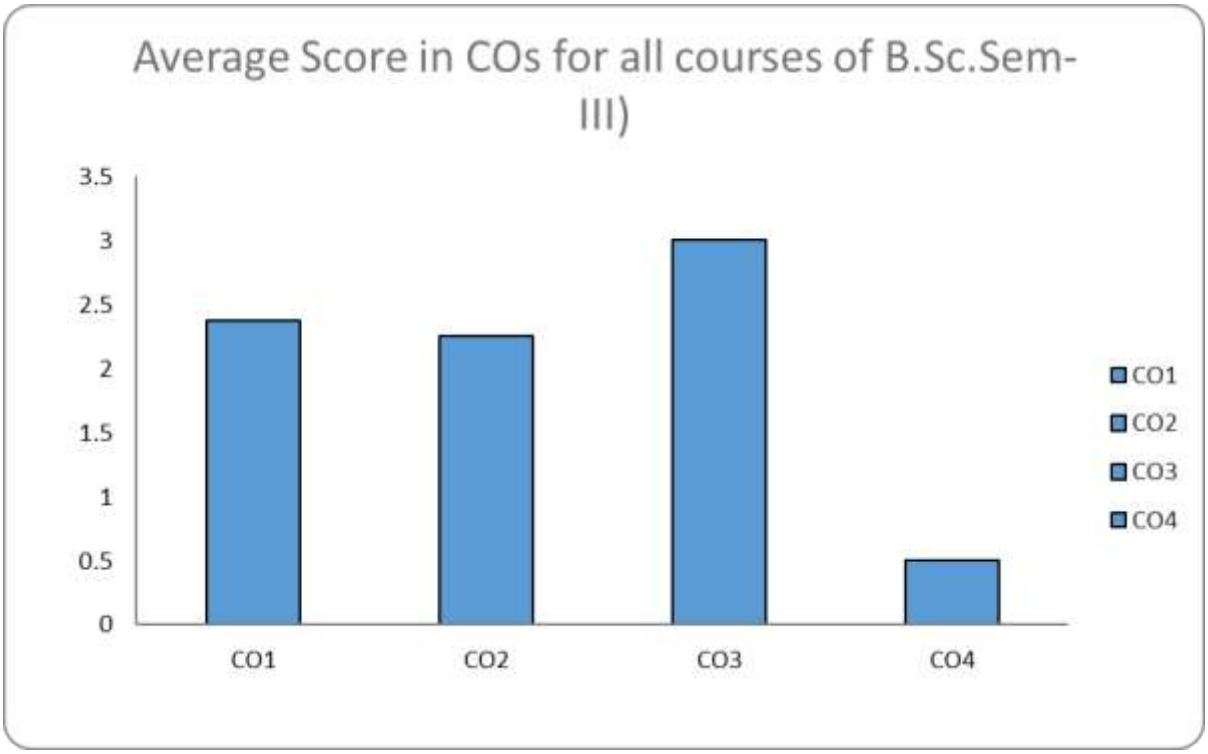
B.Sc. Sem I



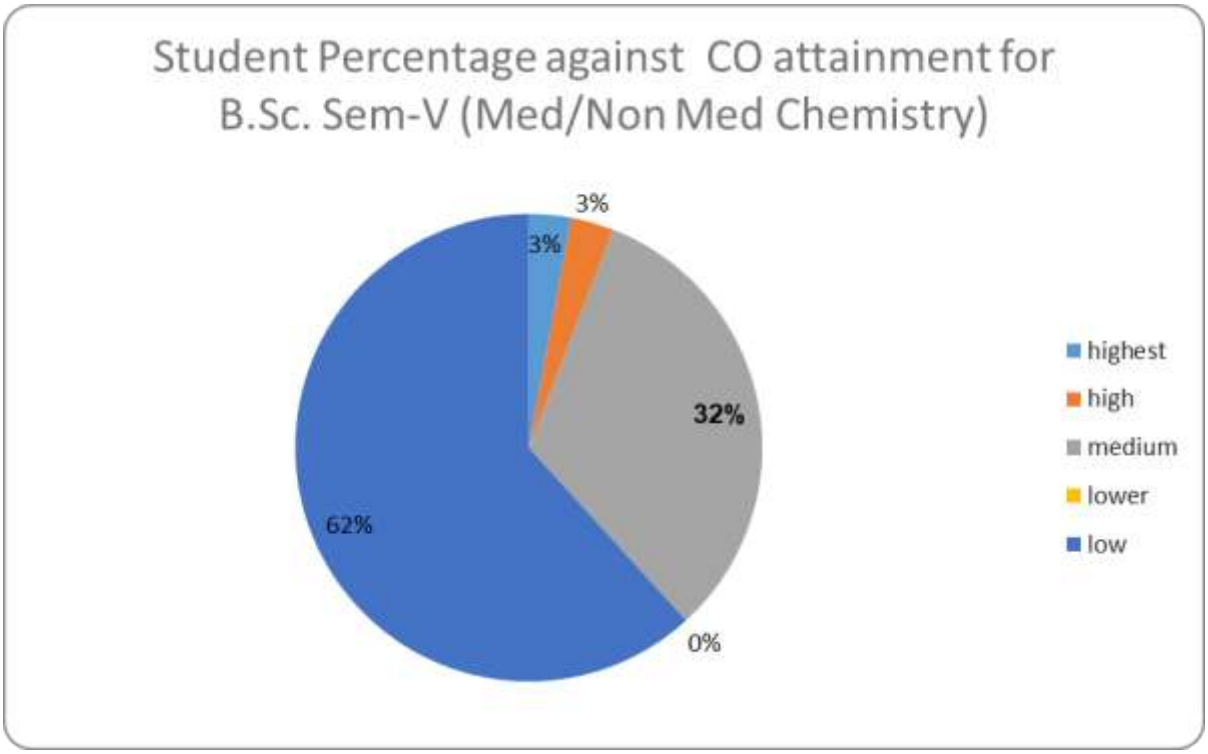


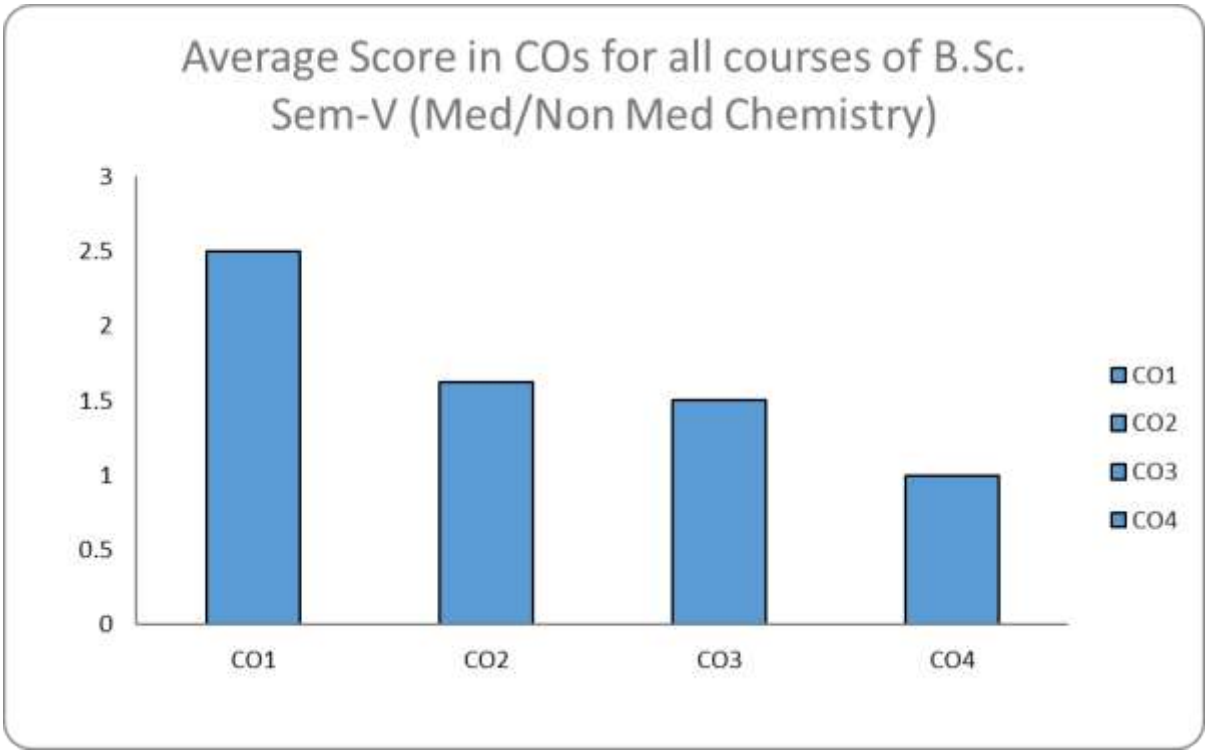
B.Sc. Sem III


Student Percentage against CO attainment for B.Sc. Sem-III
0%
0%
33%
60%
7%
highest
high
medium
lower
low

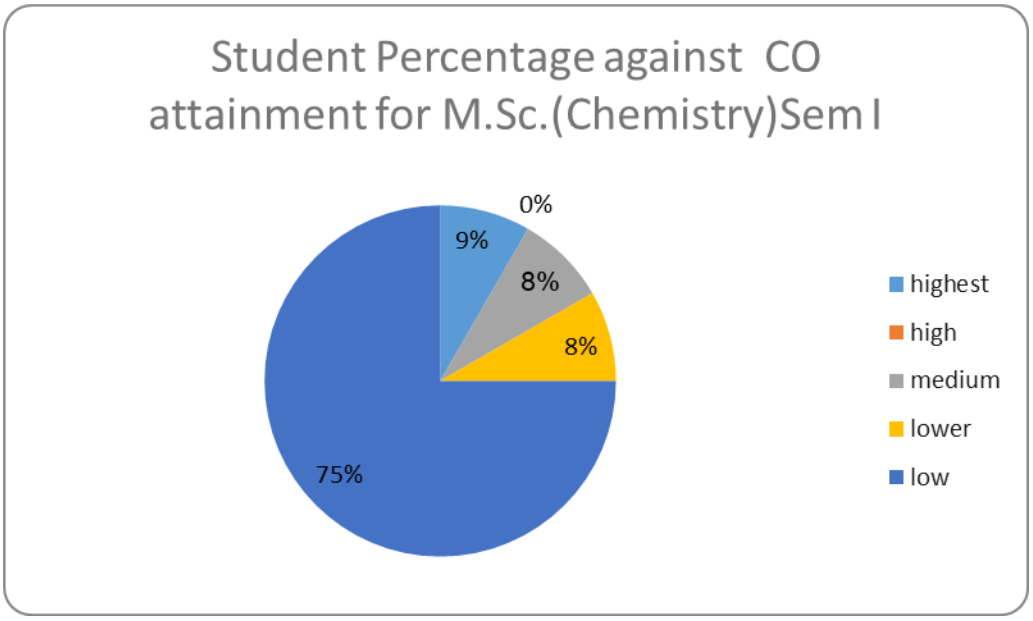

Average Score in COs for all courses of B.Sc.Sem-III)
3.5
3
2.5
2
1.5
1
0.5
0
CO1
CO2
CO3
CO4
CO1
CO2
CO3
CO4

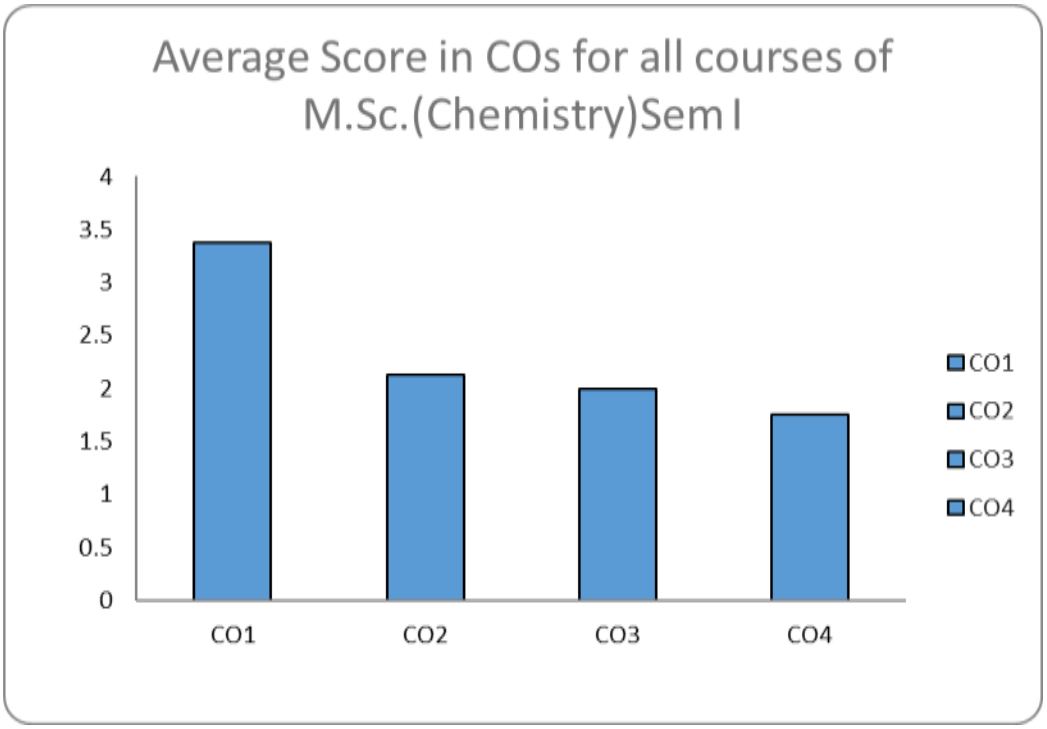
B.Sc. Sem V


Student Percentage against CO attainment for B.Sc. Sem-V (Med/Non Med Chemistry)
3%
3%
32%
62%
0%
highest
high
medium
lower
low

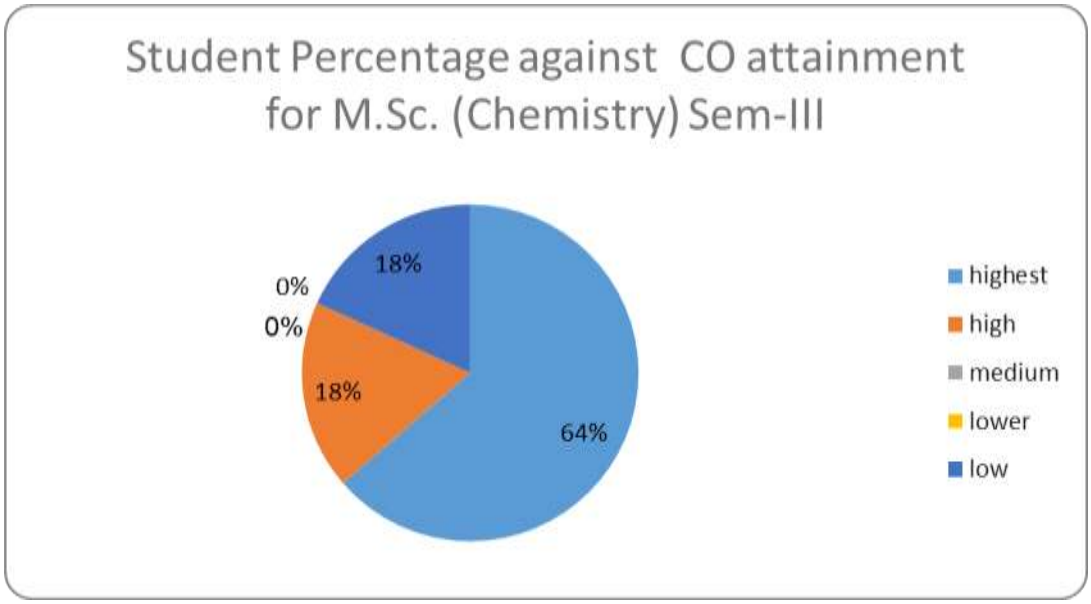

Average Score in COs for all courses of B.Sc. Sem-V (Med/Non Med Chemistry)
3
2.5
2
1.5
1
0.5
0
CO1
CO2
CO3
CO4
CO1
CO2
CO3
CO4

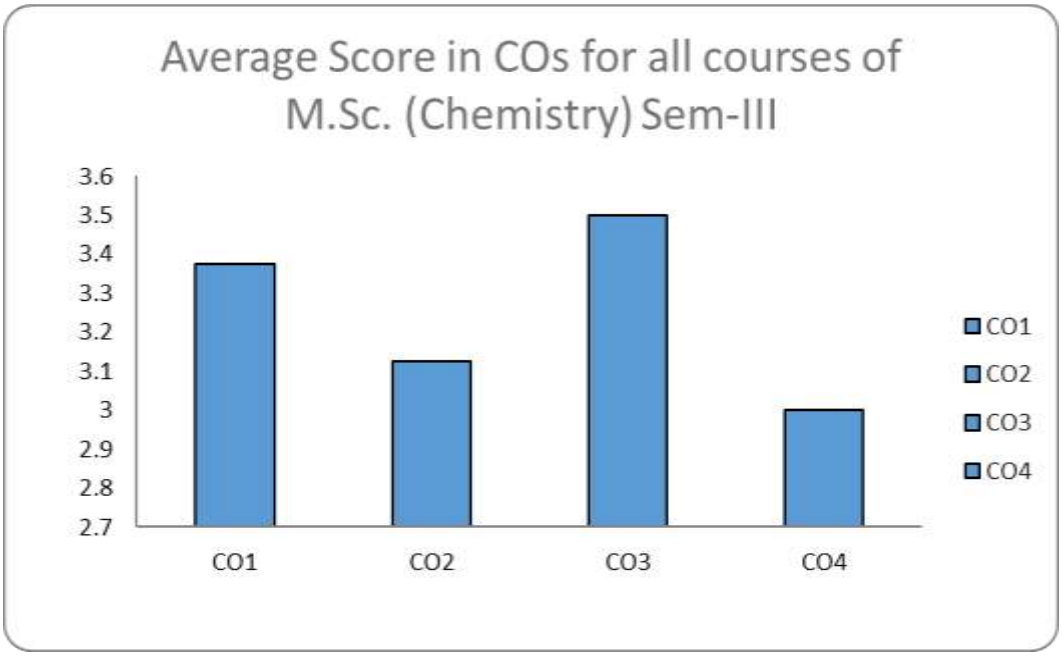
M.Sc. Sem I


Student Percentage against CO attainment for M.Sc.(Chemistry)Sem I
0%
9%
8%
8%
75%
highest
high
medium
lower
low


Average Score in COs for all courses of M.Sc.(Chemistry)Sem I
4
3.5
3
2.5
2
1.5
1
0.5
0
CO1
CO2
CO3
CO4
CO1
CO2
CO3
CO4

M.Sc. Sem III


Student Percentage against CO attainment for M.Sc. (Chemistry) Sem-III
18%
0%
0%
18%
64%
highest
high
medium
lower
low


Average Score in COs for all courses of M.Sc. (Chemistry) Sem-III
3.6
3.5
3.4
3.3
3.2
3.1
3
2.9
2.8
2.7
CO1
CO2
CO3
CO4
CO1
CO2
CO3
CO4