FACULTY OF SCIENCES

SYLLABUS
of
BACHELOR OF SCIENCE (MEDICAL)
(Semester III-IV)

(Under Credit Based Continuous Evaluation

Grading System)

Session: 2024-25

The Heritage Institution
KANYA MAHA VIDYALAYA
JALANDHAR (AUTONOMOUS)

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2024-25)

Bachelor of Science (Medical) Semester – III

Course Code		Course Name	Course Type	Credits (L-T-P)	Total Credits	Marks				Examination time (Hours)
						Total	Ext.		CA	
							L	P		
BSML-3421		Punjabi (Compulsory)	C	4-0-0	4	100	80	-	20	3
BSML-3031		[1]Basic Punjabi								
BSML-3431		[2]Punjab History & Culture								
BSML-3212		English (Compulsory)	C	4-0-0	4	100	80	-	20	3
BSMM-3483	(I)	**Zoology** (Evolution)	E	2-0-0	7	50	40	-	10	3
	(II)	**Zoology** (Biodiversity-III)		3-0-0		75	60	-	15	3
	(P)	**Zoology** (Practical–III - related to Evolution and Biodiversity-III)		0-0-2		50	-	40	10	3
BSMM-3343	(I)	**Microbiology** (Microbial Nutrition and Metabolism)	E	4-0-0	5	100	60	-	20	3
	(P)	**Microbiology** (Practical-Microbial Nutrition and Metabolism)		0-0-1			-	20		3
BSMM-3084	(I)	**Chemistry** (Organic Chemistry)	C	2-0-0	7	50	40	-	10	3
	(II)	**Chemistry** (Physical Chemistry)		3-0-0		75	60	-	15	3
	(P)	**Chemistry** (Practical)		0-0-2		50	-	40	10	3
BSMM-3075	(I)	**Botany** (Structure, Development and Reproduction in Flowering Plants-I)	E	2-0-0	7	50	40	-	10	3
	(II)	**Botany** (Structure, Development and Reproduction in Flowering Plants-II)		3-0-0		75	60	-	15	3
	(P)	**Botany** (Practical–I -Based on Papers- I and II)		0-0-2		50	-	40	10	3
BSMM-3255	(I)	**Food Science and quality control (Vocational)** (Food Chemistry and Nutrition)	E	4-0-0	5	100	60	-	20	3
	(P)	**Food Science and quality control (Vocational)** (PRACTICAL- Relatedto Food Chemistry and Nutrition)		0-0-1			-	20		3
AECE-3221		*Environmental studies	C	1-0-1	2	50	40		10	3
SECP-3512		**Personality Development Programme	AC	2-0-0	2	50	40	-	10	1
Total										

Compulsory **E-Elective** **AC- Audit Course**

[1]Special paper in lieu of Punjabi (Compulsory).

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

***Marks of these papers will not be added in total marks and only grades will be provided.**

** **Ability enhancement compulsory course**

Kanya Maha Vidyalaya, Jalandhar (Autonomous)

CURRICULUM AND SCHEME OF EXAMINATIONS OF THREE-YEAR DEGREE PROGRAM (2024-25)

Bachelor of Science (Medical) Semester – IV										
Course Code		**Course Name**	**Course Type**	**Credits**	**Total Credits**	**Marks**				**Examination time (Hours)**
						Total	**Ext.**		**CA**	
							L	**P**		
BSML-4421		Punjabi (Compulsory)	C	4-0-0	4	100	80	-	20	3
BSML-4031		[1]Basic Punjabi								
BSML-4431		[2]Punjab History & Culture								
BSML-4212		English (Compulsory)	C	4-0-0	4	100	80	-	20	3
BSMM-4483	(I)	**Zoology (**Biochemistry**)**	E	2-0-0	7	50	40		10	3
	(II)	**Zoology** (Animal Physiology)		3-0-0		75	60		15	3
	(P)	**Zoology** (PRACTICAL–IV - related to Biochemistry and Animal Physiology)		0-0-2		50	-	40	10	3
BSMM-4343	(I)	**Microbiology** (Microbial Ecology)	E	4-0-0	5	100	60	-	20	3
	(P)	**Microbiology** (PRACTICAL-Microbial Ecology)		0-0-1			-	20		3
BSMM-4084	(I)	**Chemistry** (Inorganic Chemistry)	C	3-0-0	7	75	60	-	15	3
	(II)	**Chemistry** (Orgainc Chemistry)		2-0-0		50	40	-	10	3
	(P)	**Chemistry** (Practical)		0-0-2		50	-	40	10	3
BSMM-4075	(I)	**Botany** (Diversity of seed Plants and their systematics -I)	E	2-0-0	7	50	40	-	10	3
	(II)	**Botany** (Diversity of seed Plants and their systematics -II)		3-0-0		75	60	-	15	3
	(P)	**Botany** (PRACTICAL-Based on Diversity of Microbes & Diversity of Cryptogams)		0-0-2		50	-	40	10	3
BSMM-4255	(I)	**Food Science and Quality Control** (Vocational) (Quality Assurance)	E	4-0-0	5	100	60	-	20	3
	(P)	**Food Science and quality control (Vocational)** (PRACTICAL- Quality Assurance)		0-0-1			-	20		3
SECM-4522		*Social Outreach	AC	2-0-0	2	50	40	-	10	2
Total										

C-Compulsory E-Elective AC- Audit Course

[1]Special paper in lieu of Punjabi (Compulsory).

[2] Special paper in lieu of Punjabi (Compulsory) for those students who are not domicile of Punjab.

***Marks of these papers will not be added in total marks and only grades will be provided.**

**** Ability enhancement compulsory course**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)

PUNJABI

Course Title: Punjabi (Compulsory)

Course Code- BSML -3421

COURSE OUTCOMES

CO1: 'ਚੋਣਵੇ ਪੰਜਾਬੀ ਨਿਬੰਧ' ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਵਾਰਤਕ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।

CO2: 'ਸਮਾਂ ਮੰਗ ਕਰਦਾ ਹੈ' ਇਕਾਂਗੀ ਸੰਗ੍ਰਹਿ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਇਕਾਂਗੀ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਇਸ ਸਾਹਿਤ ਰੂਪ ਨਾਲ ਜੋੜਣਾ ਹੈ।

CO3: ਸੰਖੇਪ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਸੰਖੇਪ ਵਿਚ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ।ਲੇਖ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO4: ਮੂਲ ਵਿਆਕਰਣਕ ਇਕਾਈਆਂ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵੰਨਗੀਆਂ (ਭਾਵੰਸ਼, ਸ਼ਬਦ, ਵਾਕੰਸ਼, ਉਪਵਾਕ ਅਤੇ ਵਾਕ)ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)
PUNJABI
Course Title: Punjabi (Compulsory)
Course Code- BSML -3421

ਸਮਾਂ : 3 ਘੰਟੇ **Maximum Marks: 100**
L-T-P **Theory: 80**
4-0-0 **CA: 20**

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋ ਂਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਚੋਣਵੇ ਪੰਜਾਬੀ ਨਿਬੰਧ (ਜੋਗਿੰਦਰ ਸਿੰਘ ਪੁਆਰ,ਪਰਮਜੀਤ ਸਿੰਘ ਸਿੱਧੂ), ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ,ਪਟਿਆਲਾ।
ਘਰ ਦਾ ਪਿਆਰ, ਉਮਰ ਲੰਮੀ ਹੋ ਸਕਦੀ ਹੈ,ਅੱਥਰੂ, ਪੁਰਾਣਾ ਪੰਜਾਬ, ਇੰਗਲੈਂਡ ਦਾ ਸੋਗੀ ਸੋਮਵਾਰ,ਖਿਡਾਰੀਆਂ ਦੇ ਵਹਿਮ।
(ਪਾਠ ਕ੍ਰਮ ਦਾ ਹਿੱਸਾ ਹਨ)
(ਵਿਸ਼ਾ ਵਸਤੂ/ਸਾਰ /ਕਲਾ ਪੱਖ) 16 ਅੰਕ

ਯੂਨਿਟ-II

ਸਮਾਂ ਮੰਗ ਕਰਦਾ ਹੈ (ਇਕਾਂਗੀ ਸੰਗ੍ਰਹਿ) (ਸ□ਾ. ਕਵਲ ਧਾਲੀਵਾਲ) ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ,ਲੁਧਿਆਣਾ।
(ਵਿਸ਼ਾ ਵਸਤੂ /ਸਾਰ / ਪਾਤਰ ਚਿਤਰਨ) 16 ਅੰਕ

ਯੂਨਿਟ-III

(ੳ) ਸੰਖੇਪ ਰਚਨਾ (ਪ੍ਰੈਸੀ)
(ਅ) ਲੇਖ ਰਚਨਾ 16 ਅੰਕ

ਯੂਨਿਟ-IV

ਮੂਲ ਵਿਆਕਰਣਕ ਇਕਾਈਆਂ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵੰਨਗੀਆਂ (ਭਾਵੰਸ਼, ਸ਼ਬਦ, ਵਾਕੰਸ਼, ਉਪਵਾਕ ਅਤੇ ਵਾਕ)
16 ਅੰਕ

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ;ਸੈਕਸ਼ਨ ਂੲ ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ ਜ਼ਜ਼ਜ਼ ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ ; ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ ;
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ ; ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ; ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ;
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ ;
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ ;

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)
BASIC PUNJABI
Course Title: Basic Punjabi In lieu of Punjabi (Compulsory)
Course Code - BSML -3031

Course outcomes

CO1: ਸੰਖੇਪ ਰਚਨਾ ਕਰਨ ਨਾਲ ਵਿਦਿਆਰਥੀ ਆਪਣੀ ਗੱਲ ਨੂੰ ਸੰਖੇਪ ਵਿਚ ਕਹਿਣ ਦੀ ਜਾਚ ਸਿੱਖਣਗੇ ਅਤੇ ਇਹ ਦਿਮਾਗੀ ਕਸਰਤ ਵਿਚ ਸਹਾਈ ਹੋਵੇਗੀ।ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ ਦੇਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।

CO2: ਕਵਿਤਾ ਭਾਗ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਵਿਤਾ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲ ਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ।

CO3: ਕਹਾਣੀ ਭਾਗ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਕਹਾਣੀ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਤਾਂ ਕਿ ਉਹ ਆਧੁਨਿਕ ਦੌਰ ਵਿਚ ਚੱਲ ਰਹੀਆਂ ਕਾਵਿ ਧਾਰਾਵਾਂ ਅਤੇ ਕਵੀਆਂ ਬਾਰੇ ਗਿਆਨ ਹਾਸਿਲ ਕਰ ਸਕਣ।

CO4: ਨਿਬੰਧ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ ਮੁੱਲਵਾਨ ਇਤਿਹਾਸ ਤੋਂ ਜਾਣੂ ਕਰਵਾਉਣਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)

BASIC PUNJABI

Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)

Course Code: BSML -3031

ਸਮਾਂ : 3 ਘੰਟੇ **Maximum Marks: 100**

Credits (L-T-P) **Theory: 80**

4-0-0 **CA : 20**

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ।ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ-I

ਪੈਰ੍ਹਾ ਪੜ੍ਹ ਕੇ ਪ੍ਰਸ਼ਨਾਂ ਦੇ ਉਤਰ

ਸੰਖੇਪ ਰਚਨਾ 16 ਅੰਕ

ਯੂਨਿਟ-II

ਕਵਿਤਾਵਾਂ

(ੳ) ਸਮਾਂ (ਭਾਈ ਵੀਰ ਸਿੰਘ)

(ਅ) ਖੈਰ ਪੰਜਾਬੀ ਦੀ (ਫ਼ੀਰੋਜ਼ਦੀਨ ਸ਼ਰਫ਼)

(ਏ) ਖ਼ਨਗਾਹੀ ਦੀਵਾ ਬਾਲਦੀਏ (ਪ੍ਰੋ.ਮੋਹਨ ਸਿੰਘ)

(ਸ) ਰੁੱਖ (ਸ਼ਿਵ ਕੁਮਾਰ)

(ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ,ਸਾਰ) 16 ਅੰਕ

ਯੂਨਿਟ-III

ਕਹਾਣੀਆਂ

(ੳ) ਭੂਆ (ਨਾਨਕ ਸਿੰਘ)

(ਅ) ਪੇਮੀ ਦੇ ਨਿਆਣੇ (ਪ੍ਰਿੰ. ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ)

(ਏ) ਕੁਲਫ਼ੀ (ਸੁਜਾਨ ਸਿੰਘ)

(ਸ) ਧਰਤੀ ਹੇਠਲਾ ਬੌਲਦ(ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ)

(ਵਿਸ਼ਾ ਵਸਤੂ,ਸਾਰ) 16 ਅੰਕ

ਯੂਨਿਟ-IV

ਨਿਬੰਧ

(ੳ) ਘਰ ਦਾ ਪਿਆਰ (ਤੇਜਾ ਸਿੰਘ)

(ਅ) ਮਾਂ (ਗੁਰਬਖ਼ਸ਼ ਸਿੰਘ)

(ਏ) ਭਾਈ ਮਰਦਾਨਾ ਜੀ (ਹਰਪਾਲ ਸਿੰਘ ਪੰਨੂ)

(ਸ) ਮਨੁੱਖ ਕੁਦਰਤ ਦੀ ਨੇਕ ਔਲਾਦ ਨਹੀਂ (ਸੁਰਿੰਦਰ ਮੰਡ)

(ਵਿਸ਼ਾ ਵਸਤੂ,ਸਾਰ) 16 ਅੰਕ

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1000 to 1605 A.D.)(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code: BSML-3431

COURSE OUTCOMES

After completing the paper the students will have a thorough insight into the origin of Sikh faith and its major institutions in Punjab. They will be able to

CO 1: Understand the society and culture of Medieval Punjab.

CO 2: Understand the growth of various sects during the Bhakti Movement in Punjab.

CO 3: Comprehend and analyse the teachings of Guru Nanak Dev and its relevance today

CO 4: Make a comparison between the philosophy and teachings of first five Sikh Gurus and their relevance in the present scenario and also to understand and analyse the institutions started by Sikh Gurus and their implications till date

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1000 to 1605 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code: BSML-3431

Examination Time: 3 Hours **Max. Marks: 100**
Credits (L-T-P): 4-0-0 **Theory: 80**
CA: 20

Instructions for the Paper Setter:

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.
3. Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5^{th} question may be attempted from any of the four Units.
4. Each question will carry 16 marks

Unit-I

1. Society and Culture of Punjab during Turko-Afghan Rule
2. The Punjab under the Mughals

Unit-II

3. Bhakti Movement and Impact on Society of Punjab
4. Sufism in Punjab

Unit-III

5. Guru Nanak: Early Life and Teachings
6. Concept of Sangat and Pangat

UNIT-IV

7. Contribution of Guru Angad Dev, Guru Amar Das and Guru Ram Das
8. Guru Arjun Dev and Compilation of Adi Granth

Suggested Readings

- Chopra, P. N., Puri, B.N., &Das. M.N. (1974). A Social, Cultural and Economic History of India, Vol. II. New Delhi : Macmillan India.
- Grewal, J.S. (1994) The Sikhs of the Punjab, Cambridge University Press, New Delhi.
- Singh, Fauja (1972), A History of the Sikhs, Vol. II, I. Patiala: Punjabi University.
- Singh, Khushwant (2011). A History of Sikhs- Vol. I (1469-1839), New Delhi, Oxford University Press.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)
ENGLISH
Course Title: English (Compulsory)
Course Code: BSML -3212

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: Comprehend the basics of grammatical rules governing relative clauses, adjectives, adverbs, conjunctions and prepositions through the study of ―English Grammar in Use‖ by Raymond Murphy

CO 2: Develop skills to write an essay on a given topic and enhance their vocabulary through the study of ―The Students' Companion‖ by Wilfred D. Best

CO 3: Enhance their reading and analysing power of texts through guided reading through the study of ―Making Connections‖ by Kenneth J. Pakenham

CO 4: Develop an understanding of the poems taught, relate to the socio-cultural background of England and be able to answer questions regarding tone, style and central idea through the study of the poems in the prescribes text ―Moments in Time‖

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION 2024-25)

ENGLISH

Course Title: English (Compulsory)

Course Code: BSML -3212

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

Credits(L-T-P): 4-0-0 **Theory: 80**

CA: 20

Instructions for the Examiner:

(The paper setters should avoid questions of theoretical nature from *Making Connections*.)

Section A: One question with sub-parts will be set from Unit I of the syllabus. Fifteen sentences will be set and the students would be required to attempt any ten. Each sentence will carry two marks. **(10×2=20)**

Section B: Two questions will be set from Unit II of the syllabus. The students would be required to attempt one essay out of the given two topics carrying ten marks (word limit 400 words). The second question will be based on vocabulary. The students would be required to write single words for phrases and sentences choosing any five out of eight and each carrying two mark. **(1×10 + 5×2=20)**

Section C: The students would be required to attempt two questions (with sub parts) based on exercises as given before and after reading essays in the prescribed text book *Making Connections*. **(5×2+5×2=10)**

Section D: This section will be divided into two parts. In part one, five questions based on Central idea, theme, tone and style etc. of the poems from the prescribed textbook, *Moments In Time* from Unit IV of the syllabus will be set. The students would be required to attempt any three, each carrying five marks (500 words each).

(3×5=15)

Part two will have one question (with internal choice) requiring students to explain a stanza with reference to context carrying five marks (word limit 250 words). The stanzas for explanation will be taken from the prescribed textbook, *Moments in Time* from Unit IV in the syllabus. **(1×5=5)**

Unit I

English Grammar in Use, 4th Edition by Raymond Murphy, CUP (Units 92-120)

Unit II

Essay Writing and *The Students' Companion* by Wilfred D. Best (Section 1: Single words for phrases and sentences: Words denoting Numbers and words denoting Places)

Unit III

Making Connections by Kenneth J. Pakenham, 2nd Edn. CUP: Unit-II

Unit IV

Moments in Time: Poems at Sr. No. 1-6.

Texts Prescribed:

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *The Students' Companion* by Wilfred D. Best
3. *Making Connections* by Kenneth J. Pakenham, 2nd Edn. CUP
4. *Moments in Time: An Anthology of Poems*, GNDU, Amritsar

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III (SESSION 2024-25)

ZOOLOGY

Course Title: Evolution

Course Code: BSMM-3483 (I)(THEORY)

Course Outcome

After passing this course the student will be able to:

CO1: Understand concept of evolution and identify the contributions of various Evolutionists.

CO2: Know about origin of life and concept of speciation.

CO3: Gain knowledge about fossils and its significance as well as evolution of man.

CO4: Understand ecological adaptations in fishes, reptiles, birds and mammals.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)
ZOOLOGY
Course Title: Evolution
Course Code: BSMM-3483(I)
(THEORY)

Time: 3 Hours **Max. Marks: 50**
Credits (L-T-P): 2-0-0 **Theory: 40**
CA: 10

Instructions for the Paper Setter

Eight questions of equal marks (8 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 attemptfive questions, selecting at least one question from each section. The fifth question may be attempted from any Section.

UNIT-I

Introduction to evolution
Evidences of organic evolution
Theories of organic evolution

UNIT-II

Origin of life
Concept of micro, macro and mega-evolution
Concept of Species
Speciation

UNIT-III

Fossils, its types and significance
Evolutionary rate
Origin & Extinction of reptiles
Evolution of man (in Brief)

UNIT-IV

Migration & Parental Care in Pisces
Flight adaptation & Bird migration
Adaptive radiations like scales & fins in fish, poison apparatus in snakes and dentition in Mammals.

Suggested Readings:

1. Avers, C. J.(1989). Evolution Process and Pattern in Evolution, New York Oxford Oxford university press.
2. Bhamarah, H.S.(1993), Juneka K., Cytogenetics & Evolution, Anmol Publication Pvt. Ltd.
3. Brookfield, A. P. (1986). Modern aspects of Evolution. Nelson Thornes publishers
4. Colbert. E.H. (2002), Evolution of Vertebrates, cbspd publishers
5. Freeman, S. and Herron, Jon C. (2007). Evolutionary analysis, Pearson Prentice Hall, New Jersey.

6. Futuyma, D. J. (1998), Evolutionary Biology, Sinauer Assoc. Inc. Pub. USA.
7. Meglitsch, P. A. (1991), Invertebrate Zoology (3rd ed), Oxford University Press.
8. Wen-Hsiung Li (1997), Molecular Evolution, Sinauer associatesInc.Pub. USA.
9. Rastogi, V.B(2003) Organic evolution, Medtech publishers
10. Strickberger, M.N(2000) Evolution , Jones and Bartlett publishers.
11. Tomar, B.S. and S.P.Singh (2000)Evolutionary Biology, Rastogi publishers.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

ZOOLOGY

Course Title: Biodiversity-III (Chordates)

Course Code: BSMM-3483 (II)

(THEORY)

Course Outcome

After passing this course the student will be able to:

CO1: Understand general body plan of Herdmania and external characters of Amphioxus.

CO2: Understand external characters and affinities of Petromyzon as well as body systems of Labeo.

CO3: Understand body plan and various systems of Frog and Uromastix.

CO4: Understand body systems of Pigeon and Rat.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)
ZOOLOGY
Course Title: Biodiversity-III (Chordates)
Course Code: BSMM-3483 (II)
(THEORY)

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

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

Instructions for the Paper Setter

Eight questions of equal marks (6 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

Brief Introduction to Protochordata

Urochordata: Type study- *Herdmania*
Cephalochordata: External features and affinities of *Amphioxus*

Unit II

Cyclostomata: External Characters of *Petromyzon*

Affinities of Cyclostomata

Pisces: Type study-*Labeo*

Unit III

Amphibia: Type study-Frog

Reptilia: Type study-*Uromastix*

Unit IV

Aves: Type study-Pigeon
Mammals: Type study-Rat

Suggested Reading Material.

1. Dhami, P.S. &Dhami J.K. (1998), Vertebrates, R. Chand & Co., New Delhi.
2. Hildebrand, M. and Goslow. Jr. G.E. (2001), Analysis of Vertebrates Structure, John Wiley, N. Y.

3. Jollie, M. (1968), Chordate Morphology, Reinhold, New York.
4. Kardong, K. V. (1995), Vertebrates – Comparative Anatomy, Function, Evolution. W.B.C. Pub. , Oxford.
5. Kent, G. C. and Carr, R. K. (2001), Comparative Anatomy of the Vertebrates (9^{th}ed), McGraw Hill Higher Education, New York.
6. Linzey, D. (2001), Vertebrate Biology, McGraw Hill Publishing Company, New York.
7. Pough, F. H., Heiser, J. B. and McFarland, W. N. (1990), Vertebrate Life (3^{rd} ed), Macmillan Pub. Co., New York.
8. Young, J. Z. (1982), The Life of Vertebrates, New York.
9. Parker, T.J. and Haswell, W.A (1981) Text Book of Zoology, Vol. II (Vertebrates), ELBS and Macmillian Press Ltd.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

ZOOLOGY

Course Title: Practical-III (Related to Evolution and Biodiversity-III)

Course Code: BSMM-3483 (P)

(PRACTICAL)

Course Outcomes

After passing this course the student will be able to:

CO1: Familiarize organ systems.

CO2: Know about Biodiversity belonging to different Taxa.

CO3: Aware about economically important specimens (preserved).

CO4: Understanding of evolutionary phenomena.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

ZOOLOGY

Course Title: Practical-III (Related to Evolution and Biodiversity-III)

Course Code: BSMM-3483 (P)

(PRACTICAL)

Time: 3 hrs. **Max Marks: 50**
Credits (L-T-P): 0-0-2 **Practical: 40**
CA: 10

Instructions for the Practical Examiners: Question paper is to 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.

Guidelines for conduct of Practical Examination:

1.	Draw a labelled sketch of the system of the given animal & explain it to the Examiner.	3
2.	Identify and classify the specimens upto order level. Write a short note on habitat, special features, feeding, habits and economic importance of the specimens.	8
3.	Idendify and write a note on the evolutionary phenomenon in the given specimen.	2
4.	Identify the slides/specimens, give two reasons for identification.	3
5.	Viva-voce & Practical file.	4

I. Classification up to order level, except in case of Pisces and Aves where classification up to subclass level, habits, habitat, external characters and economic importance (if any) of the following animals is required:

Urochordata **:** *Herdmania, Molgula, Pyrosoma, Doliolum, Salpa&Oikopleura.*

Cephalochordata: *Amphioxus.* Study of the following prepared slides:

T.S. *Amphioxus* through various regions, Pharynx of *Amphioxus*

Cyclostomata : *Myxine, Petromyzon & Ammocoetes*Larva.

Chondrichthyes : *Zygaena* (hammer head shark), *Pristis* (saw fish), *Narcine (electric ray), Trygon, Rhinobatus and Chimaera* (rabbit fish).

Actinoptergii :*Polypterus, Acipenser, Lepidosteus, Muraena, Mystus, Catla, Hippocampus, Syngnathus, Exocoetus, Anabas, Diodon, Tetradon, Echeneis and Solea.*

Dipneusti (**Dipnoi**): *Protopterus*(African lung fish)

Amphibia : *Uraeotyphlus, Necturus, Amphiuma, Amblystoma*and its Axolotl Larva, *Triton, Salamandra, Hyla, Rhacophorus*

Reptilia : *Hemidactylus, Calotes, Draco, Varanus, Phrynosoma, Chamaeleon, Typhlops, Python, Eryx, Ptyas, Bungarus, Naja, Hydrus, Vipera,*

Crocodilus, Gavialis, Chelone(turtle) and *Testudo* (tortoise), Differences in nonpoisonous and poisonous snakes.

Aves : *Casuarius, Ardea, Anas, Milvus, Pavo, Eudynamics, Tyto* and *Alcedo.*

Mammalia : *Ornithorhynchus, Echidna, Didelphis, Macropus, Loris, Macaca, Manis, Hystrix, Funambulus, Panthera, Canis, Herpestes, Capra, Pteropus.*

II. Study of the following systems with the help of charts/models/videos:

Herdmania **:** General anatomy

Labeo : Digestive and reproductive systems, heart, afferent and branchial arteries, cranial nerves and internal ear.

Pigeon : Digestive, arterial, venous and urino-genital systems.

WhiteRat : Digestive, arterial, venous and urino-genital systems.

Study of permanent slides of whole mount of Pharynx of *Herdmania*and *Amphioxus.*

Cycloid scales of *Labeo,* blood smear of mammal, Histology of rat/rabbit (compound tissues)

Demonstration of evolutionary phenomena like homology, analogy, mimicry, crypsis.

Note:- Some changes can be made in the practical depending on the availability of material.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

MICROBIOLOGY

Course Title: Microbial Nutrition and Metabolism

Course Code: BSMM-3343

(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Understand the nutritional requirements for growth of microorganisms and types of microorganisms on the basis of nutrition.

CO2: Understand the transport of nutrients across the cell membrane.

CO3: Learn about the metabolic pathways and electron transport chain of bacteria.

CO4: Learn about the enzyme kinetics and biosynthesis of nucleic acid.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

MICROBIOLOGY

Course Title: Microbial Nutrition and Metabolism

Course Code: BSMM-3343

(THEORY)

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

Credits (L-T-P): 4-0-0 **Theory: 60**

Practical: 20

CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 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

Nutrition, requirements for growth of microorganisms, nutrients and accessory constituents, medium designing. Nutritional types of microorganisms (photolithotrophs, photoorganotrophs, chemolithotrophs and chemoorganotrophs)

UNIT–II

Transport of nutrients across the cell membrane, diffusion, passive transport, active transport, and group translocation for the transport of nutrients across the membrane. Bioenergetics; Laws of thermodynamics, entropy, enthalpy and free energy of reaction standard.

UNIT–III

Oxidative phosphorylation, electron transport, respiratory chains of bacteria, energy metabolism in aerobic and anaerobic microorganisms, pathways for breakdown of glucose (glycolysis, pentose phosphate pathways, Krebs cycle), gluconeogenesis, metabolism of starch & cellulose by bacteria.

UNIT–IV

Assimilation of nitrogen, synthesis of purine and pyrimidine nucleotides, biosynthesis of nucleic acids, Enzyme kinetics, Michaelis-Mentenequation and allosteric enzymes.

Books Recommended:

1.Pelczar, M.I., Chan, E.C.S. and Krieg, N.R. 2023, 5th edition, Microbiology. Tata McGraw Hill Publishing Co., Ltd., New Delhi.

2.Stanier, R.Y., Ingraham, J.L., Wheelis, M.L. and Painter, P.R. 2005, 5th edition, General Microbiology, MacMillan Education Ltd. Publisher.

3.Powar, C.B. and Dagniwala, H.F. 2012, General Microbiology, Volume I and II, Himalaya Publishing House, Delhi.

4. Sharma, P.D. 2010, Microbiology, Rastogi Publications, Meerut. 142.

5. Bacterial physiology and metabolism by Byung Hong Kim and Geoffrey Michael Gadd. **(Online available)**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III (SESSION 2024-25)

MICROBIOLOGY

Course Title: Microbial Nutrition and Metabolism

Course Code: BSMM-3343

(PRACTICAL)

COURSE OUTCOMES:

After passing the course student will be able to:

CO1: Analyze the growth of bacteria by different techniques.

CO2: Identify the fermenting and non-fermenting bacteria.

CO3: Demonstrate Sthe effect of various concentrations of Carbon and Nitrogen on bacteria.

CO4: Demonstrate the effect of various parameters such as temperature, pH, salt and metal on growth of bacteria.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III (SESSION 2024-25)

MICROBIOLOGY

Course Title: Microbial Nutrition and Metabolism

Course Code: BSMM-3343

(PRACTICAL)

Time: 3 Hours **Practical: 20**

Credits (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.

LIST OF PRACTICALS

1. Isolation and enumeration of total bacteria from soil by pour plating and spread plating.
2. Comparison of growth on complex medium and defined or minimal medium.
3. Distinction between fermenting and non-fermenting microorganisms.
4. Effects of various concentrations of carbon source on bacterial growth.
5. Effects of various concentrations of nitrogen source on bacterial growth.
6. Effect of temperature on bacterial growth.
7. Effect of pH on bacterial growth.
8. Effect of salt on bacterial growth.
9. Effect of metals(Ag, $Cu2^{+}$, $Ni2^{+}$)on bacterial growth.
10. Effect of dye (Crystal violet-basic) on bacterial growth.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-III (SESSION 2024-25)
CHEMISTRY
Course Title: Chemistry (Organic Chemistry)
Course Code: BSMM -3084 (I) (THEORY)

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 (MEDICAL) SEMESTER-III (SESSION 2024-25)
CHEMISTRY
Course Title: Chemistry (Organic Chemistry)
Course Code: BSMM -3084 (I)
(THEORY)

Exam Time: 3 Hrs. **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 (MEDICAL) SEMESTER III (SESSION: 2024-25)
CHEMISTRY
Course Title: Chemistry (Physical Chemistry)
Course Code: BSMM-3084 (II) (THEORY)

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, 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 (MEDICAL) SEMESTER III (SESSION: 2024-25)
CHEMISTRY
Course Title: Chemistry (Physical Chemistry)
Course Code: BSMM-3084 (II) (THEORY)

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

Instructions for the Paper Setter

Eight questions of equal marks (twelve 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

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 (MEDICAL) SEMESTER III (SESSION 2024-25)
CHEMISTRY
Course Title: Chemistry Practical
Course Code: BSMM -3084 (P)
(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 (MEDICAL) SEMESTER III (SESSION: 2024-25)
CHEMISTRY
Course Title: Chemistry Practical
Course Code: BSMM-3084 (P)
(PRACTICAL)

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

Credits (L-T-P): 0-0-2 **Practical: 40**

CA: 10

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 recordto 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).

Practical Examination

1) Volumetry / Gravimetry	11
2) Thin Layer chromatography	04
3) Viva-Voce	03
4) Note Book	02

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

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

BOTANY

Course Title: Structure, Development and Reproduction in Flowering Plants-I

Course Code: BSMM-3075 (I)

(THEORY)

Course outcome:

After passing this course the student will be able to:

CO1: Understanding of basic body plan of a flowering plant, Diversity in plant form branching pattern and canopy architecture trees.

CO2: Understanding of shoot apical meristem and its histological organization. Cambium and its function and formation of secondary xylem.

CO3: Understanding of wood in relation to water and minerals, growth rings and structure of secondary phloem and periderm.

CO4: Understanding of origin, development, arrangement and diversity in size and shape of leaf, internal structure in relation to photosynthesis and water loss, senescence and abscission.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)
BOTANY
Course Title: Structure, Development and Reproduction in Flowering Plants-I
Course Code: BSMM-3075 (I)
(THEORY)

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

Instructions for the Paper Setters:

Eight questions of equal marks (8 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

The basic body plan of a flowering plant-modular type of growth. Diversity in plant form in annuals, biennials and perennials; trees-largest and longest-lived, branching pattern; monopodial and sympodial growth; canopy architecture.

UNIT-II

The Shoot System: The shoot apical meristem and its histological organization; meristematic and permanent tissue, formation of internodes. Cambium and its functions; formation of secondary xylem.

UNIT-III

A general account of wood structure in relation to conduction of water and minerals; characteristics of growth rings, sapwood and heart wood; role of woody skeleton; secondary phloem-structure function relationships; periderm.

UNIT-IV

Leaf: Origin, development, arrangement and diversity in size and shape; internal structure in relation to photosynthesis and water loss; adaptations to water stress; senescence and abscission.

Suggested Readings:

1. Beck, C.B. (2010). An Introduction to Plant Structure and Development: Plant anatomy for the Twenty First Century (2nd Edition). Cambridge University Press, UK.
2. Cutler, D. F., Botha, T. and Stevenson, D. M. (2008). Plant Anatomy: An Applied Approach. Blackwell Publishing, Oxford, UK.

3. Dickison, W.C. (2000). Integrative Plant Anatomy. Academic Press, California, USA.
4. Mauseth, J.D. (1988). Plant Anatomy, The Benjamin/Cummings Publishing Company Inc., Menlo Park, California, USA.
5. Raven, P.H., Evert, R.F. and Eichhorn, S.E. (2012). Biology of Plants, 8th edition. W.H. Freeman and Co., Worth Publishers, New York.
6. Rudall, P. J. (2010). Anatomy of Flowering Plants: An Introduction to Structure and Development (3rd Edition). Cambridge University Press, UK.
7. Thomas, P. (2014) Trees: Their Natural History, Cambridge University Press, Cambridge.
8. Srivastava, H.N. (2018) Diversity of Seed Plants and Their Systematics, Vol. III, Pradeep's Publication.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

BOTANY

Course Title: Structure, Development and Reproduction in Flowering Plants-II

Course Code: BSMM-3075 (II)

(THEORY)

Course Outcomes:

After passing this course student will be able to:

CO1: Recognize the major groups of vascular plants and their phylogenetic relationships.

CO2: Know the structure and development of monocot and dicot embryos.

CO3: Understand different means of vegetative reproduction.

CO4: Understand physiology of seed germination.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

BOTANY

Course Title: Structure, Development and Reproduction in Flowering Plants-II

Course Code: BSMM-3075 (II)

(THEORY)

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

Credits (L-T-P): 3-0-0 **Theory-60**

CA: 15

Instructions for the Paper Setters:

Eight questions of equal marks (12 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

The Root System: The root apical meristem; differentiation of primary and secondary tissues and their roles; structural modification for storage, respiration, reproduction and for interaction with microbes.

UNIT-II

Vegetative Reproduction: various methods of vegetative propagation. Detailed study and types of grafting and budding, economic aspects. Flower: A modified shoot; structure, development and varieties of flower; functions

UNIT-III

Structure of anther and pistil; the male and female gametophytes; types of pollination; attractions and reward for pollinators; (sucking and foraging types); pollen-pistil interaction self-incompatibility.

UNIT-IV

Double fertilization: formation of seed endosperm and embryo: fruit development and maturation Significance of Seed: Suspended animation; ecological adaptation; unit of genetic recombination with reference to reshuffling of genes and replenishment; dispersal strategies.

Suggested Readings:

- Bhojwani, S.S., Bhatnagar, S.P. and Dantu P.K. (2015). The Embryology of Angiosperms, 6th edition. Vikas Publishing House, Delhi.
- Hartmann, H.T. and Kestler, D.E. (2010). Plant Propagation: Principles and Practices, 8th edition, Prentice Hall of India Pvt. Ltd., New Delhi.
- Mauseth, J.D. (1988). Plant Anatomy, The Benjamin/Cummings Publishing Company Inc., Menlo Park, California, USA.
- Peau, K. (2006). Anatomy of Seed Plants, 3rd edition. John Wiley & Sons, New York.
- Pegeri, K. and Vander Pijl (2013). The Principles of Pollination Biology, Pergamon Press, Oxford.

- Raven, P.H., Evert, R.F. and Eichhorn, S.E. (2014). Biology of Plants, 8th edition. W.H. Freeman and Co., Worth Publishers, New York.
- Srivastava, H.N. (2018) Diversity of Seed Plants and Their Systematics, Vol. III, Pradeep's Publication.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

BOTANY

Course Title: Practical- Structure, Development and Reproduction in Flowering Plants- I & II

Course Code: BSMM-3075 (P)

(PRACTICAL)

Course Outcomes:

After passing this course student will be able to:

CO1: Develop knowledge about the role of herbarium techniques in plant identification.

CO2: Understand different life forms exhibited by flowering plants.

CO3: Understand anatomy of different plant parts using free hand razor technique.

CO4: Examine flower and their mode of pollination.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER III (SESSION: 2024-25)

BOTANY

Course Title: Practical- Structure, Development and Reproduction in Flowering Plants- I & II

Course Code: BSMM-3075 (P)

(PRACTICAL)

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

Credits (L-T-P): 0-0-2 **Theory-40**

CA: 10

Instructions for the paper setter: 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

Suggested Laboratory Exercises

1. Study of any commonly occurring dicotyledonous plant (for example *Solanum nigrum* or Kalanchoe) to the body plan, organography and modular type of growth.
2. Life forms exhibited by flowering plants (by a visit to a forest or a garden, Study of tree like habit in cycads, bamboo, banana, traveller's tree (*Revenala madagascariensis*) and Yucca and comparison with true trees as exemplified by conifers and dicotyledons.
3. L.S. Shoot tip to study the cytohistological zonation and origin of leaf primordia.
4. Monopodial and sympodial types of branching in stems (especially rhizomes).
5. Anatomy of primary and secondary growth in monocots and dicots using free hand razor technique (*Solanum, Boerhavia*, *Helianthus*, *Mirabilis*, *Nyctanthus*, *Draceana*, Maize) hand sections (or prepared slides). Structure of secondary phloem and xylem. Growth rings in wood, microscopic study of wood in T.S., T.L.S. and R.L.S.
6. Field study of diversity in leaf shape, size, thickness, surface properties. Internal structure of leaf. Structure and development of stomata (using epidermal peels of leaf).
7. Anatomy of the root. Primary and secondary structure.
8. Examination of a wide range of flowers available in the locality and methods of their pollination.
9. Structure of anther, microsporogenesis (using slides) and pollen grains (using whole mounts). Pollen viability using in vitro pollen germination.
10. Structure of ovule and embryo sac development using serial sections from permanent slides.
11. Nuclear and cellular endosperm. Embryo development in monocots and dicots (using permanent slides/dissections).

12. Simple experiments to show vegetative propagation (leaf cuttings in *Bryophyllum*, *Sansevieria*, *Begonia*; stem cuttings in rose, *Salix*, money plant, Sugarcane and *Bougainvillea*).
13. Germination of non-dormant and dormant seeds.

Suggested Readings:

- Bhojwani, S.S., Bhatnagar, S.P. and Dantu P.K. (2015). The Embryology of Angiosperms, 6th edition. Vikas Publishing House, Delhi.
- Hartmann, H.T. and Kestler, D.E. (2010). Plant Propagation: Principles and Practices, 8th edition, Prentice Hall of India Pvt. Ltd., New Delhi.
- Mauseth, J.D. (1988). Plant Anatomy, The Benjamin/Cummings Publishing Company Inc., Menlo Park, California, USA.
- Peau, K. (2006). Anatomy of Seed Plants, 3rd edition. John Wiley & Sons, New York.
- Pegeri, K. and Vander Pijl (2013). The Principles of Pollination Biology, Pergamon Press, Oxford.
- Raven, P.H., Evert, R.F. and Eichhorn, S.E. (2014). Biology of Plants, 8th edition. W.H. Freeman and Co., Worth Publishers, New York.
- Srivastava, H.N. (2018) Diversity of Seed Plants and Their Systematics, Vol. III, Pradeep's Publication.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III (SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging Course
Code: BSMM-3255
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Learn about the methods of food preservation and processing of fats, oils and sugar.

CO2: Learn about the processing of salt, tea, coffee, chocolate and cocoa powder, extruded foods and role of enzymes in food processing.

CO3: Learn about spices and flavors, food additives and manufacturing of fermented products.

CO4: Understand types of packaging materials, their properties and machinery.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III(SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255(P)
(Practical)

Time: 3 Hrs. **Max. Marks: 100**
Credits (L-T-P): 4-0-0 **Theory-60**
Practical: 20
CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 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

Physical principles underlying food processing operations including thermal processing, ionizing radiation, refrigeration, freezing, dehydration.
Chemical preservation in food processing.
Fats and Oils: Types and sources of fats and oils (animal and vegetable), processing, uses, storage and nutritional aspects.
Sugar and Sugar Products: Different forms of sugar (sugar, jaggery, honey syrup), manufacture, selection, storage and use.

UNIT-II

Salt: preparation of brine and pickling.
Processing of: Tea, coffee, chocolate and cocoa powder.
Extruded foods.
Enzymes: Definition, factors affecting enzyme activity, role of enzymes in food processing.

UNIT –III

Fermentation technology, manufacturing of fermented products: Wine, vinegar, beer, yoghurt.
Spices and flavors.
Food additives, classes of food additives, role in food processing.

UNIT-IV

Definition and functions of Packaging

Types of packaging materials: metal, glass, wood, paper and plastics and their importance

Types of packages and their evaluation: bottle, pouch, tetra-pack and cans

Packaging machinery

Shelf life testing

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III(SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255(P)
(Practical)

Books Recommended

1. Post Harvest Technology of Cereals, Pulses and Oilseeds, 2019, 3rd Edition, Amalendu Chakraverty.
2. Technology of Cereals, 1994, 4th Edition, Norman Leslie Kent and A.D. Evers.
3. Preservation of Fruits & Vegetables, 2009, GirdhariLal, G.S Siddappa and G.L Tandon.
4. Principles of Food Packaging, 1980, 2nd Edition, Stanley Sacharow and Roger C. Griffin.
5. Chemistry of food additives and preservatives, 2012, 1st Edition, Titus A.M. Msagati.
6. Food Preservation, 2nd Edition, M. ShafiurRahman. **(Online available)**
7. Food Packaging – Principles and practice, 3rd Edition, 2012, Gordon L. Robertson **(Online available)**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III(SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255(P)
(Practical)

Course Outcomes:

CO1: Ability to identify various food packaging materials.

CO2: Assessing the physical characteristics of cereals and assessment of gluten quality in wheat flour.

CO3: Understanding of blanching as food processing technique and its importance in food preservation and quality.

CO4: Conducting strength tests on packaging materials to assess their durability.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–III(SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Food Processing and Packaging
Course Code: BSMM-3255(P)
(Practical)

Time: 3 Hrs. **Practical: 20**
Credits (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.

List of Practicals

1. Determination of physical characteristics of cereals.
2. Milling of wheat into flour.
3. Determination of wet and dry gluten contents.
4. Identification of packaging materials.
5. To estimate the shelf life of packaged food.
6. To determine the strength of different packaging material.
7. To find out the tin coating weight.
8. To find out the uniformity and amount of wax on wax paper.
9. To check the chemical resistance of packaging materials.
10. To check the adequacy of blanching.
11. Visit to various industries dealing with food packaging material like, paper board and metal.

ENVIRONMENTAL STUDIES
Course Title: Environmental Studies (Compulsory)
Course Code- AECE -3221

Course Outcomes

After passing this course students will be able to:

CO1: Understand the concept and need of environmental education.

CO2: Understand the role of an individual in conservation of natural resources.

CO3: Learn about role of major Eco system and their conservation.

CO4: Develop desirable attitude, value and respect for protection of Biodiversity.

CO5: Learn about the control measure of pollution and solid waste management.

CO6: Understand the role of different agencies in the protection of environment.

CO7: Knowledge regarding welfare programmes and Human rights.

CO8: Knowledge about the applied value of environmental studies.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER-III (SESSION 2024-25)

ENVIRONMENTAL STUDIES

Course Title: ENVIRONMENTAL STUDIES (Compulsory)

Course Code- AECE -3221

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

Credits (L-T-P): 1-0-1 **Theory: 30**

Practical: 10

CA: 10

Instructions for the Paper Setter:

The question paper should carry 30 marks. The structure of the question paper being:

Part-A: Attempt any five questions out of seven. Each question carries 2 marks. Answer to each question should not exceed 1 page

Part-B: Essay type with inbuilt choice – 20 marks.

Attempt any five questions out of eight. Each question carries 4 marks. Answer to each question should not exceed 3 pages.

UNIT-I

The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

UNIT-II

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems.

(a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.

(b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

(c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

(e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.

(f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

UNIT-III

Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem

- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries).

Unit IV

Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and optionvalues
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

Unit V

Environmental Pollution

Definition

- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution , Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

Unit VI

Social Issues and the Environment

- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents andholocaust. Case studies.

- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

Unit VII

Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

Unit VIII

Field Work

- Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc

References:

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
2. Down to Earth, Centre for Science and Environment, New Delhi.
3. Heywood, V.H. & Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.
4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press,New Delhi.

7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.
8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut
9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi
10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House,New Delhi

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
Course Title: Punjabi (Compulsory)
Course Code: BSML -4421

COURSE OUTCOMES

CO1: 'ਪਗਡੰਡੀਆਂ' (ਸਵਜੀਵਨੀ) **ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ** ਸਵ ਜੀਵਨੀ **ਸਾਹਿਤ ਰੂਪ ਪ੍ਰਤੀ ਦਿਲਚਸਪੀ, ਸੂਝ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ।**

CO2: 'ਫ਼ਾਸਲ' (ਨਾਟਕ) **ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰ ਕੇ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ** ਨਾਟਕ **ਨੂੰ ਪੜ੍ਹਣ ਦੀ ਰੁਚੀ ਨੂੰ ਪੈਦਾ ਕਰਨਾ ਹੈ ਅਤੇ** ਨਾਟਕ **ਜਗਤ ਨਾਲ ਜੋੜਣਾ ਹੈ।**

CO3: ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ ਅਤੇ ਅਖ਼ਬਾਰ ਵਿਚ ਇਸ਼ਤਿਹਾਰ ਲਿਖਣਾ ਸਿਖਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਨੂੰ ਇਸ ਕਲਾ ਵਿਚ ਨਿਪੁੰਨ ਕਰਨਾ ਹੈ I

CO4: ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰਨ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਦੁਆਰਾ ਲਿਖ਼ਤ ਵਿਚ ਕੀਤੀਆਂ ਜਾਣ ਵਾਲੀਆਂ ਗਲਤੀਆਂ ਨੂੰ ਸੁਧਾਰਨਾ ਹੈ।ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ ਨੂੰ ਪੜ੍ਹਾਉਣ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਅੰਦਰ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਅਮੀਰੀ ਦਾ ਅਤੇ ਬਾਰੀਕੀਆਂ ਨੂੰ ਸਮਝਣ ਲਈ ਵੱਖਰੇ -ਵੱਖਰੇ ਸਿਧਾਂਤਾਂ ਦਾ ਵਿਕਾਸ ਕਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
Course Title: Punjabi (Compulsory)Course
Code: BSML -4421

ਸਮਾਂ : 3 ਘੰਟੇ
Credits (L-T-P)
4-0-0

Maximum Marks: 100
Theory: 80
CA: 20

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠਕ੍ਰਮ ਅਤੇ ਪਾਠ ਪੁਸਤਕਾਂ

ਯੂਨਿਟ-I

ਪਗਡੰਡੀਆਂ (ਸਵਜੀਵਨੀ) **: ਡਾ.ਬਚਿੰਤ ਕੌਰ**

(ਸਾਰ /ਵਿਸ਼ਾ ਵਸਤੂ / ਆਤਮ ਬਿੰਬ) **16 ਅੰਕ**

ਯੂਨਿਟ-II

ਫ਼ਾਸਲ (ਨਾਟਕ) **:ਜਤਿੰਦਰ ਬਰਾੜ,**

(ਵਿਸ਼ਾ ਵਸਤੂ/ਸਾਰ /ਨਾਟ ਜੁਗਤਾਂ) **16 ਅੰਕ**

ਯੂਨਿਟ-III

(ੳ) ਦਫ਼ਤਰੀ ਚਿੱਠੀ ਪੱਤਰ

(ਅ) ਅਖ਼ਬਾਰ ਵਿਚ ਇਸ਼ਤਿਹਾਰ **16 ਅੰਕ**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
Course Title: Punjabi (Compulsory)Course
Code: BSML -4421

ਯੂਨਿਟ-IV

ਵਿਆਕਰਣ

(ੳ) ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ

(ਅ) ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ **16 ਅੰਕ**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)
Course Code: BSML -4421

Course outcomes

CO1: ਮ ੁੱਢਲ ਪੰਜਾਬੀ ਦ ਵਵਦਆਰਥੀ **'ਆਤਮ ਅਨਾਤਮ' (ਕਵਿਤਾ ਭਾਗ) ਦੇ** ਨਾਮਵਰ ਕਵੀਆ **ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼** ਦੀਆ ਰਚਨਾਵਾ **ਦੀ ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ** ਤੋਂ ਜਾਣ ਹ ਸਕਣਗ

CO2: ਮ ੁੱਢ ਪੰਜਾ ਬੀ ਦ ਵਵਦਆਰਥੀ **'ਆਤਮ ਅਨਾਤਮ' (ਕਵਿਤਾ ਭਾਗ) ਦੇ** ਵ ੁੱਖ ੁੱਖਰੀਆ ਧਾਰਾਵਾ ਨਾਲ ਸਬਧਤ **ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼** ਦੀਆ ਰਚਨਾਵਾ **ਦੇ ਸਾਰ** ਤੋਂ ਜਾਣ ਹ ਸਕਣਗ

CO3: ਮ ੁੱਢ ਪੰਜਾ ਬੀ ਦ ਵਵਦਆਰਥੀ **'ਆਤਮ ਅਨਾਤਮ' (ਕਵਿਤਾ ਭਾਗ) ਦੇ** ਵ ੁੱਖ ੁੱਖਰੀਆ ਧਾਰਾਵਾ ਨਾਲ ਸਬਧਤ **ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਕਵੀਆਂ ਦੇ ਜੀਵਨ ਅਤੇ ਰਚਨਾ** ਤੋਂ ਜਾਣ ਹ ਸਕਣਗ

CO4: ਲੇਖ ਰਚਨਾ ਦਾ ਮਨੋਰਥ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਬੁੱਧੀ ਨੂੰ ਤੀਖਣ ਕਰਦਿਆਂ ਉਨਾਂ ਦੀ ਲਿਖਣ ਪ੍ਰਤਿਭਾ ਨੂੰ ਉਜਾਗਰ ਕਰਨਾ ਹੈ।ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਨੂੰ ਸਿਲੇਬਸ ਵਿਚ ਸ਼ਾਮਿਲ ਕਰਨ ਦਾ ਮਕਸਦ ਵਿਦਿਆਰਥੀਆਂ ਦੁਆਰਾ ਲਿਖ਼ਤ ਵਿਚ ਕੀਤੀਆਂ ਜਾਣ ਵਾਲੀਆਂ ਗਲਤੀਆਂ ਨੂੰ ਸੁਧਾਰਨਾ ਹੈ।

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
Course Title: Basic Punjabi (In lieu of Punjabi Compulsory)
Course Code: BSML -4421

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

ਅੰਕ ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਸੈਕਸ਼ਨ ਹੋਣਗੇ।ਸੈਕਸ਼ਨ A-D ਤੱਕ ਦੇ ਪ੍ਰਸ਼ਨ ਯੂਨਿਟ I-IV ਵਿਚੋਂ ਪੁੱਛੇ ਜਾਣਗੇ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਕਰਨਾ ਲਾਜ਼ਮੀ ਹੈ।ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਸੈਕਸ਼ਨ ਵਿਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ 16 ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਪਾਠਕ੍ਰਮ

ਯੂਨਿਟ-I

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)(ਸੰਪਾਦਕ ਡਾ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਡਾ.ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।
ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਸਿਲੇਬਸ ਦਾ ਹਿੱਸਾ ਹਨ।
ਪ੍ਰਸੰਗ ਸਹਿਤ ਵਿਆਖਿਆ

16 ਅੰਕ

ਯੂਨਿਟ-II

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)(ਸੰਪਾਦਕ ਡਾ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਡਾ.ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।
ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਸਿਲੇਬਸ ਦਾ ਹਿੱਸਾ ਹਨ।
(ਸਾਰ)

16 ਅੰਕ

ਯੂਨਿਟ-III

ਆਤਮ ਅਨਾਤਮ (ਕਵਿਤਾ ਭਾਗ)(ਸੰਪਾਦਕ ਡਾ. ਸੁਹਿੰਦਰ ਬੀਰ ਅਤੇ ਡਾ.ਵਰਿਆਮ ਸਿੰਘ ਸੰਧੂ
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।
ਮੋਹਨ ਸਿੰਘ,ਜਗਤਾਰ,ਸੁਰਜੀਤ ਪਾਤਰ,ਪਾਸ਼ ਸਿਲੇਬਸ ਦਾ ਹਿੱਸਾ ਹਨ।
(ਕਵੀਆਂ ਦੇ ਜੀਵਨ ਅਤੇ ਰਚਨਾ ਬਾਰੇ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ)

16 ਅੰਕ

ਯੂਨਿਟ-IV

ਲੇਖ ਰਚਨਾ
ਅਸ਼ੁੱਧ ਸ਼ਬਦ ਜੋੜਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਕੇ ਲਿਖਣਾ **16 ਅੰਕ**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1605 to 1849 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)Course Code:
BSML-4431

COURSE OUTCOMES

After completing the paper the students will have a thorough insight into the origin of Sikh faith and its major institutions in Punjab

CO 1: Understand the adoption of new policy by Guru Hargobind and martyrdom of Guru Tegh Bahadur

CO 2: To understand the factors leading to the establishment of Khalsa Panth and its impact

CO 3: Have deep insight into the conflict with Mughals and the rise of Banda Singh Bahadur and aftermath.

CO 4: Understand the administration under Maharaja Ranjit Singh, also the fairs, festivals and folk music of Punjab.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
PUNJAB HISTORY AND CULTURE
Course Title: Punjab History and Culture (From 1605 to 1849 A.D.)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)
Course Code: BSML-4431

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

Instructions for the Paper Setter:

1. Question paper shall consist of four Units
2. Examiner shall set 8 questions in all by selecting Two Questions of equal marks from each Unit.
3. Candidates shall attempt 5 questions in 1000 words, by at least selecting One Question from each Unit and the 5^{th} question may be attempted from any of the four Units.
4. Each question will carry 16 marks

Unit-I

1. Transformation of Sikhism under Guru Hargobind.
2. Martydom of Guru Teg Bahadur

Unit-II

3. Creation of Khalsa
4. Khalsa and its impact on the Punjab

Unit-III

5. Banda Bahadur and his achievements
6. Rise of Misls.

UNIT IV

7. Maharaja Ranjit Singh:- Civil, Military and Land Revenue Administration.
8. Fair, Festivals and Folk Music in the Punjab during the medieval period (Jarag, Baisakhi and Diwali)

Suggested Readings

- Chopra P.N., Puri, B.N., & Das, M.N.(1974), A Social, Cultural & Economic History of India. Vol.II, Macmillan India Limited, New Delhi.
- Grewal, J.S. (1994). The Sikhs of the Punjab, Cambridge University Press, New Delhi.
- Singh, Fauja (1972). A History of the Sikhs, Vol. III, Patiala: Punjabi University.
- Singh, Kushwant (2011). A History of the Sikhs- Vol. I (1469-1839). New Delhi:
- Singh, Kirpal (1990). History and Culture of the Punjab-Part II (Medieval Period).

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
ENGLISH
Course Title: English (Compulsory)
Course Code: BSML -4212

COURSE OUTCOMES

After passing this course, the students will be able to:

CO 1: Comprehend the basics of grammatical rules governing prepositions and phrasal verbs through the study of ―English Grammar in Use‖ by Raymond Murphy

CO 2: Develop skills to write an essay on a given topic and enhance their vocabulary through the study of ―The Students' Companion‖ by Wilfred D. Best

CO 3: Enhance their reading and analysing power of texts through guided reading through the study of ―Making Connections‖ by Kenneth J. Pakenham

CO 4: Develop an understanding of the poems taught, relate to the socio-cultural background of England and be able to answer questions regarding tone, style and central idea through the study of the poems in the prescribes text ―Moments in Time‖

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)
ENGLISH
Course Title: English (Compulsory)
Course Code: BSML -4212

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

Instructions for the Examiner:
(The paper setters should avoid questions of theoretical nature from *Making Connections*.)

Section A: One question with subparts will be set from Unit I of the syllabus. Fifteen sentences will be set andthe students would be required to attempt any ten. Each sentence will carry two marks. **(10x2=20)**

Section B: Two questions will be set from unit II of the syllabus. The student will be required to write one essay out of the given two topics carrying 10 marks (word limit 400 words). The Second question will be based on vocabulary. The students would be required to write single words for phrases and sentences choosing any five out of eight and each carrying two marks.

(1x10+5x2=20)

Write a personal letter on any of the given two topics. This question will carry 10 marks. (II) Vocabulary (Antonyms/Synonyms). 10 words will be given. The students will give the Antonyms/Synonyms of any five words. This question will carry 10 marks.

(2x10=20)

Section C: The students would be required to attempt two questions (with sub parts) based on exercises as given before and after reading essays in the prescribed text book *Making Connections*. **(5×2 + 5×2=20)**

Section D: This section will be divided into two parts. In part one, five questions based on Central idea, theme, tone and style etc. of the poems from the prescribed textbook, *Moments In Time* from Unit IV of the syllabus will be set. The students would be required to attempt any three, each carrying five marks (200 words each). **(3×5=15)**

Part two will have one question (with internal choice) requiring students to explain a stanza with reference to context carrying five marks (word limit 250 words). The stanzas for explanation will be taken from the prescribed textbook, *Moments in Time* from Unit IV in the syllabus. **(1×5=5)**

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION 2024-25)

ENGLISH

Course Title: English (Compulsory)

Course Code: BSML -4212

Unit I

English Grammar in Use, 4th Edition by Raymond Murphy, CUP (Units 121-145)

Unit II

Essay Writing and *The Students' Companion* by Wilfred D. Best (Section 1: Single words for phrases and sentences: Words pertaining to Government, words pertaining to Marriage, Opposites and Negatives)

Unit III

Making Connections by Kenneth J. Pakenham, 2nd Edn. CUP: Unit IV

Unit IV

Moments in Time: Poems at Sr. No. 7-12

Texts Prescribed:

1. *English Grammar in Use* (Fourth Edition) by Raymond Murphy, CUP
2. *The Students' Companion* by Wilfred D. Best
3. *Making Connections* by Kenneth J. Pakenham, 2nd Edn. CUP
4. *Moments in Time: An Anthology of Poems*, GNDU, Amritsar

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2024-25)
ZOOLOGY

Course Title: Biochemistry

Course Code: BSMM-4483 (I)

(THEORY)

Course Outcome

After passing this course the student will be able to:

CO1: Understand the structure and functions of biologically important molecules.

CO2: Understand about enzymes, coenzymes and lipid metabolism.

CO3: Understand various processes of carbohydrate metabolism.

CO4: Gain knowledge about protein metabolism.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2024-25)
ZOOLOGY

Course Title: Biochemistry

Course Code: BSMM-4483 (I)

(THEORY)

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

Instructions for the Paper Setter

Eight questions of equal marks (8 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

Biochemistry and its scope
Classification and functions of:
- Carbohydrates
- Proteins
- Lipids
- Nucleic acids

Unit II

Enzymes:
- Nature and their classification
- Coenzymes.

Lipid Metabolism:
- B-Oxidation of fatty acid
- Ketosis

Unit III

Carbohydrate Metabolism:
- Glycolysis
- Tricarboxylic acid cycle
- Hexose monophosphate shunt
- Glycogenesis
- Glycogenolysis
- Gluconeogenesis
- Oxidative Phosphorylation

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2024-25)
ZOOLOGY

Course Title: Biochemistry

Course Code: BSMM-4483 (I)

(THEORY)

Unit IV

Protein Metabolism:

Metabolism of amino acids
Oxidative deamination
Transamination, Decarboxylation, Hydrolysis of proteins, Ornithine cycle

Suggested Reading Material:-

1. Conn, E.E., Stump. P.K. Bruening, S. and Doi R.H. (2006), Outlines of Biochemistry (5th ed), John Wiley and Sons Inc., New York.
2. Fischer, J. and Arriold, J.R.P. (2001). Instant notes in Chemistry for Biologists, Viva Books Pvt. Ltd.
3. Harper, H.A. (2018): Harper's Biochemistry (31st ed).
4. Holde, K.E.V., Johnson, W.C. and Shing, P. (2005). Principles of Physical Biochemistry Prentice Hall, Inc., USA.
5. Lehninger, A (2017). Principles of Biochemistry, (7th ed).
6. Morris, H. Best, L.R., Pattison, S., Arerna, S. (2013). Introduction to General Organic Biochemistry, (11th ed), Wadsworth Group.
7. Robert, K., Murray, Mayes Daryl, K. Granner, Victor, W., Woodwell (1990), Harper's Biochemistry, 22nd Edition, Prentice Hall International Inc.
8. Sheehan, D (2013). Physical Biochemistry: Principles and Applications – John Wiley & Sons Ltd., England.
9. Stryer, L. (2019). Biochemistry (9th ed), San Francisco W.H. Freeman.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2024-25)
ZOOLOGY

Course Title: Animal Physiology

Course Code: BSMM-4483 (II)

(THEORY)

Course Outcomes

After passing this course the student will be able to:

CO1: Understand mechanism of digestion and respiration.

CO2: Have knowledge about composition of blood, blood groups, cardiac cycle and urine formation.

CO3: Understand mechanism of skeletal muscle contraction and neural integration.

CO4: Understand physiology of behavior and endocrine system.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2024-25)
ZOOLOGY

Course Title: Animal Physiology

Course Code: BSMM-4483 (II)

(THEORY)

Max. Time: 3 Hrs. **Max Marks: 75**
Credits (L-T-P): 3-0-0 **Theory: 60**
CA: 15

Instructions for the Paper Setter

Eight questions of equal marks (10 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

Digestion : Digestion of dietary constituents, regulation of digestive processes and absorption. Extra and intra cellular digestion, enzymatic digestion and symbiotic digestion.

Respiration : Transport of O_2 and CO_2, Oxygen dissociation curve of haemoglobin, Bohr effect, chloride (-) shift, Haldane effect and control of breathing.

Unit II

Heart : Origin and regulation of heart beat, cardiac cycle, electrocardiogram, cardiac output, Blood pressure and micro-circulation.

Blood : Composition and functions of blood and lymph. Blood clotting. Blood groups including Rh factor, haemopoiesis

Excretion : Urine formation and osmoregulation.

Unit III

Muscles : Ultrastructure, chemical and physical basis of skeletal muscle contraction.

Neural Integration: Structure of neuron, resting membrane potential, Origin and propagation of impulse along the axon, synapse and myoneural function.

Unit IV

Physiology of Behavior: Taxes and reflexes, instinctive and motivate learning and reasoning

Endocrine : Structure and physiology of thyroid, parathyroid, adrenal, hypothalamus, pituitary, pancreas and gonads.

Suggested Reading Material:

1. Guyton, and Hall, (2015), Text Book of Medical Physiology, 15th Edition, Elsevier.
2. Hill, R. W., Wyse, G. K. and Anderson, N. 3 edi (2012), Animal physiology, Sinauer

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2024-25)
ZOOLOGY

Course Title: Animal Physiology

Course Code: BSMM-4483 (II)

(THEORY)

Associate, INC. Pub. Saunderland, Massachusettes, USA.

3. Hoar, W. S. (1984), General and Comparative Physiology, Prentice Hall of India Pvt. Limited, New Delhi, India.
4. Prosser, C.L.4th Edi (1991), Comparative Animal Physiology, Satish Book Enterprise Books seller & Publishers, Agra.
5. Purves, W. K., Oriane, G. H., Space, H. C. and Salava, D. (2001), Life – The Science of Biology (6th ed), Sinauer Assoc. Inc., USA.
6. Randall, D., Burggren, K.L. and French, K. (2002), Eckert Animal Physiology: Mechanisms and Adaptations, W.H. Freeman and Company, New York.
7. Taneja, S.K.(1997), Biochemistry & Animal Physiology, Trueman Book Co.
8. Willmer, P. Stone, G. and Johnston, I (2000). Environmental Physiology of Animals, Blackwell Science.
9. Withers, P.C. (1992), Comparative Animal Physiology, Saunder College Publishing, New York.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER IV (SESSION: 2024-25)
ZOOLOGY

Course Title: Practical- IV (Related to Biochemistry and Animal Physiology)

Course Code: BSMM-4483 (P)

(PRACTICAL)

Course Outcomes

CO1: Learn clinical procedures for blood & urine analysis.

CO2: Develop skill in simple biochemical laboratory procedures.

CO3: Skill in observing and to some extent in analysing various Biological Data.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
ZOOLOGY

Course Title: Practical -IV (Related to Biochemistry and Animal Physiology)

Course Code: BSMM-4483 (P)

(PRACTICAL)

Time: 3hrs. **Max. Marks: 50**

Credits (L-T-P): 0-0-2 **Practical: 40**

CA: 10

Instructions for the Practical Examiners: Question paper is to 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. Study of the skeleton of *Scoliodon, Rana, Varanus, Gallus* and *Oryctolagus*.
2. Identification of food stuffs: starch, glucose, proteins and fats in solution.
3. Demonstration of osmosis and diffusion.
4. Demonstrate the presence of amylase in saliva, denaturation by pH and temperature.
5. Determination of coagulation and bleeding time of blood in man/rat/rabbit.
6. Determination of blood groups of human blood sample.
7. Recording of blood pressure of man.
8. Analysis of urine for urea, chloride, glucose and uric acid.
9. Estimation of haemoglobin content.
10. Field study: Visit to a fossil Park/Lab/ Science City and submit a report / Familiarity with the local vertebrate fauna.

Guidelines for conduct of Practical Examination:

1.	Identify the given bones, make labeled sketches of their respective–views	8
2.	Write down the steps and determine the constituents in the given sample.	3
3.	Write the procedure and perform the given physiology experiment.	3
4.	Report on visit to a fossil park/lab/Science City/study of local vertebrate fauna.	2
5.	Viva-voce & Practical file.	4

Note:- Some changes can be made in the practical depending on the availability of material.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343

(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the Diversity of various microbial habitats.

CO2: Understand the various microbial interactions and competition for survival in nature.

CO3: Understand the role of microorganisms in geochemical cycles, concept of microbial toxins, biofertilizers and bioinsecticides.

CO4: Understand the effluent treatment, bioremediation and bioleaching.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343

(THEORY)

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

Credits (L-T-P): 4-0-0 **Theory Marks: 60**

Practical Marks: 20

CA: 20

Instructions for the Paper Setters: Eight questions of equal marks 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

Diversity of microbial habitats: Environmental selecting factors: - physical, chemical and biological types of microbial habitats: - atmospheric, aquatic and terrestrial environments.

UNIT–II

Microbial interactions, antagonism, commensalism, symbiosis, parasitism miscellaneous associations in nature. Competition for survival in nature (for nutrients, space, oxygen).

UNIT–III

Role of microorganisms in geochemical cycles: Carbon cycle, nitrogen cycle, phosphorus cycle and sulphur cycle, microbial toxins in the environment: Types of Microbial toxins, ecological consequences of microbial toxins as insecticidal agents, bioinsecticides, biofertilizers.

UNIT–IV

Concept of BOD and COD, Sewage and effluent treatment by primary, secondary and tertiary methods. Role of microbes in bioremediation of persistent pollutants and bioleachingof metals.

Books Recommended: (Edition of books updated)

a. Edmonds, P., 1978, Microbiology: An Environmental Perspective, MacMillan Publishing Co., Inc., New York.

b. Powar C.B. and Danginwala, H.F., 2017, General Microbiology, Volume II, 2nd ed. Himalaya Publishing House, New Delhi.

c. Sharma, P.D., 2010, Microbiology, Rastogi Publication, Meerut.

d. Pleczar, M.J., Chan, E.C.S. and Krieg N.R., 2011 (reprint), Microbiology, 2nd ed. Tata McGraw Hill Publishing Co., Ltd., New Delhi.

e. Patel, A.H., 2011, Industrial Microbiology, 2nded. Macmillan India Ltd., Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343 (P)

(PRACTICAL)

COURSE OUTCOMES

After passing the course student will be able to:

CO1: Learn to isolate bacteria from air and soil

CO2: Determination of BOD and COD of water samples

CO3: Analyze the quality of water by MPN

CO4: Identify rhizobia in root nodules

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

MICROBIOLOGY

Course Title: Microbiology Ecology

Course Code: BSMM-4343 (P)

(PRACTICAL)

Time: 3 hrs **Marks: 20**

Credits (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.

LIST OF PRACTICALS

1. Isolation and enumeration of fungi from air and soil by pour plating and spread plating.
2. Determination of dissolved oxygen content (DO) of the given water sample byTitrimetric method.
3. Determination of COD of the given water sample by Titrimetric method.
4. To conduct bacteriological examination of water sample by MPN method.
5. To isolate symbiotic nitrogen bacteria from root nodules.
6. To perform crowded plate method for studying microbial interactions.
7. Determination of B.O.D.
8. Lethal effect of Ultra violet light on bacterial growth.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

CHEMISTRY

Course Title: Inorganic Chemistry

Course Code: BSMM-4084 (I)

(THEORY)

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 the properties 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 (MEDICAL) SEMESTER–IV (SESSION 2024-25)

CHEMISTRY

Course Title: Inorganic Chemistry

Course Code: BSMM-4084 (I)

(THEORY)

Time: 3 Hrs. **Max. Marks: 75**
Credits (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-Aqueous Solvents **(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 (MEDICAL) SEMESTER–IV (SESSION 2024-25)

CHEMISTRY

Course Title: Organic Chemistry

Course Code: BSMM-4084 (II)

(THEORY)

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 (MEDICAL) SEMESTER–IV (SESSION 2024-25)

CHEMISTRY

Course Title: Organic Chemistry

Course Code: BSMM-4084 (II)

(THEORY)

Time: 3 Hrs. **Max. Marks: 50**
Credits (L-T-P): 2-0-0 **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 **(8 Hrs)**

Nomenclature, structure and bonding, physical properties, acidity of carboxylic acids, effects of substituents on acid strength. Reactions of carboxylic acids. Hell-Volhard-Zelinskyreaction. Synthesis of acid chlorides, esters and amides. Reduction of carboxylic acids. Mechanism of decarboxylation.

Carboxylic Acids Derivatives **(7 Hrs)**

Structure and nomenclature of acid chlorides, esters, amides and acid anhydrides, Relative stability and reactivity of acyl derivatives. Physical properties, interconversion of acid derivatives by nucleophilic acyl substitution. Preparation of carboxylic acid derivatives, chemical reactions. Mechanisms of esterification and hydrolysis (acidic and basic).

Unit–II

Ethers and Epoxides **(5 Hrs)**

Nomenclature of ethers and methods of their formation, physical properties. Chemical reaction- cleavage and autoxidatio n, 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)**

Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes, Mechanisms of nucleophilc substitution in nitroarenes and their reduction in acidic, neutral and alkaline media. Reactivity, 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. Organozinc and Organo copper Compounds: Nomenclature, structural features, Methods of formation and chemical reactions.

Heterocyclic Compounds (8 Hrs)

Introduction: Molecular orbital picture and aromatic characteristics of pyrrole, furan, thiophene and pyridine. Methods of synthesis and chemical reactions with particular emphasis on the mechanism of electrophilic substitution. Mechanism of nucleophilic substitution reactions in pyridine derivatives. 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 (MEDICAL) SEMESTER–IV (SESSION 2024-25)

CHEMISTRY

Course Title: Chemistry Practical

Course Code: BSMM-4084 (P)

(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 (MEDICAL) SEMESTER–IV (SESSION 2024-25)

CHEMISTRY

Course Title: Chemistry Practical

Course Code: BSMM-4084 (P)

(PRACTICAL)

Duration: 3 hrs. **Max. Marks: 50**
Credits (L-T-P): 0-0-2 **Practical: 40**
CA: 10

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.

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.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

BOTANY

Course Title: Diversity of Seed Plants and Their Systematics-I
Course Code: BSMM-4075 (I)

(THEORY)

Course outcome: -

After passing this course the student will develop:

CO1: Understanding of characters of seed plants, origin and evolution of seed habit, angiosperms and gymnosperms

CO2: Understanding of general characters of gymnosperms, their classification and evolution including fossil and living gymnosperms.

CO3: Understanding of morphology of vegetative and reproductive parts of *Pinus* and *Cycas*

CO4: Understanding of morphology of vegetative and reproductive parts of *Ephedra* and *Ginkgo*

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

BOTANY

Course Title: Diversity of Seed Plants and Their Systematics-I
Course Code: BSMM-4075 (I)

(THEORY)

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

Credits (L-T-P): 2-0-0 **Theory: 40**

CA: 10

Instructions for the Paper Setters:
Eight questions of equal marks (8 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

Characteristics of seed plants; Evolution of the seed habit; Distinguishing features of angiosperms and gymnosperms. Angiosperms: Origin and evolution. Some examples of primitive angiosperms.

Unit–II

General features of gymnosperms and their classification; evolution and diversity of Gymnosperms including fossil and living gymnosperms; Geological time scale and fossilization.

Unit–III

Morphology of vegetative and reproductive parts; Anatomy of root, Stem and leaf; reproduction and life cycle of *Pinus*, *Cycas*.

Unit–IV

Morphology of vegetative and reproductive parts; Anatomy of root, Stem and leaf; reproduction of life cycle of *Ephedra* and *Ginkgo*.

Suggested Readings: -

1. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms, New Age International Limited, New Delhi.
2. Gifford, E.M. and Foster, A.S. (1988). Morphology and Evolution of Vascular Plants, W.H. Freeman& Company, New York.
3. Pellant, C. (1994). Fossils, Dragon's World, Great Britain
4. Sporne, K.R. (1965). The Morphology of Gymnosperms, Hutchinson & Co. (Publishers) Ltd., London.
5. Taylor, T. N., Taylor, E. L. and Krings, M. (2008). Paleobotany: The Biology and Evolution of Fossil Plants (2nd Edition). Elsevier Inc. Netherlands.
6. Vashistha, P. C. (2016). Botany for degree students. S. Chand and Company, New Delhi.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
BOTANY
Course Title: Diversity of Seed Plants and Their Systematics-II
Course Code: BSMM-4075 (II)
(THEORY)

Course outcome: -

After passing this course the student will develop:

CO1: Plant description, describe the morphological and reproductive stretch of plant and also identify the different families.

CO2: Understanding of Botanical Nomenclature, classification of angiosperms and Salient features of the systems proposed by Bentham and Hooker, Engler and Prantl

CO3: Understanding diversity of flowering plants in families like Ranuculaceae, Brassicaceae, Rutaceae, Fabaceae, Apiaceae, Acanthaceae.

CO4: Understanding diversity of flowering plants in families like Apocynaceae, sclepiadaceae, Solanaceae, Lamiaceae, Chenopodiaceae, Euphorbiaceae, Liliaceae, Orchidaceae and Poaceae.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)

BOTANY

Course Title: Diversity of Seed Plants and Their Systematics-II

Course Code: BSMM-4075 (II)

(THEORY)

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

Credits (L-T-P): 3-0-0 **Theory: 60**

CA: 15

Instructions for the Paper Setters:

Eight questions of equal marks (10 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

Angiosperm taxonomy; Brief history, Aims and fundamental components (alpha-taxonomy, Omega-taxonomy, Holotaxonomy); Identification, keys. Taxonomic literature. Botanical nomenclature: Taxonomic ranks; Type concept; Principle of priority.

Unit–II

Major contribution of cytology, Phytochemistry and taximetrics to taxonomy. Classification of angiosperms; Salient features of the systems proposed by Bentham and Hooker, Engler and Prantl

Unit–III

Diversity of flowering plants as illustrated by members of the families Ranuculaceae, Brassicaceae, Rutaceae, Fabaceae, Apiaceae, Acanthaceae.

Unit–IV

Diversity of flowering plants as illustrated by members of the families Apocynaceae, Asclepiadaceae, Solanaceae, Lamiaceae, Chenopodiaceae, Euphorbiaceae, Liliaceae, Orchidaceae and Poaceae.

Suggested Readings: -

1. Bendre, A. (2007). Practical Botany, Rastogi Publications, Meerut.
2. Davis, P.H. and Heywood, V.H. (1963). Principles of Angiosperm Taxonomy, Oliver and Boyd, London.
3. Gifford, E.M. and Foster, A.S. (1988). Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.
4. Jeffrey, C. (1982). An Introduction to Plant Taxonomy, Cambridge University Press, Cambridge, London.
5. Jones, S.B., Jr. and Luchsinger, A.E. (1986). Plant Systematics (2nd edition). McGraw- Hill Book Co., New York.
6. Radford, A.E. (1986). Fundamental of Plant Systematics, Harper and Row, New York

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
BOTANY
Course Title: Practical- Diversity of Seed Plants and Their Systematics-I & II
Course Code: BSMM-4075 (P)
(PRACTICAL)

Course outcome: -

After passing this course the student will able to:

CO1: Identify different plants from different families through their vegetative and reproductive characters.

CO2: Understanding different types of placentation system.

CO3: study the identification keys in taxonomy.

CO4: Understand anatomy of gymnosperm.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
BOTANY
Course Title: Practical- Diversity of Seed Plants and Their Systematics-I & II
Course Code: BSMM-4075 (P)
(PRACTICAL)

TIME: 3Hours **Max. Marks: 50**

Credits (L-T-P):0-0-2 **Practical: 40**

CA: 10

Instructions for the paper setter: 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.

Suggested Laboratory Exercises

1. Angiosperms The following species are suitable for study.
2. This list is only indicative. Teachers may select plants available in their locality. Teachers may select plants/material available in their locality/institution.

1. Ranunculaceae: *Ranunculus, Delphinium*
2. Brassicaceae: *Brassica, Alyssum, Iberis, Coronopus.*
3. Malvaceae*: Hibiscus, Abutilon.*
4. Rutaceae: *Murraya, Citrus.*
5. Fabaceae: Faboideae: *Lathyrus, Cajanus, Melilotus, Trigonella,* Caesalpinioideae*: Cassia, Caesalpinia,* Mimosoideae: *Prosopis, Mimosa, Acacia*.
6. Apiaceae: *Coriandrum. Foeniculum, Anethum.*
7. Acanthaceae: *Adhatoda, Peristrophe.*
8. Apocynaceae: *Vinca, Thevetia, Nerium.*
9. Asclepiadaceae: *Calotropis.*
10. Solanaceae: *Solanum, Withania, Datura*.
11. Euphorbiaceae: *Euphorbia, Phyllanthus.*
12. Lamiaceae: *Ocimum, Salvia.*
13. Chenopodiaceae: *Chenopodium, Beta.*
14. Liliaceae: *Asphodelus, Asparagus.*
15. Poaceae: *Avena, Triticum, Hordeum, Poa, Sorghum.*

The Students should be made familiar with the use of identification keys including use of computers in taxonomy. The teachers should prevent students from collecting plants from the wild and submitting them for the practical examination. Instead, the student should be asked to prepare field reports.

Gymnosperms

Cycas

(i) Habit, armour of leaf bases on the stem (if specimen is not available show Photography), very young leaf (circinate vernation) and old foliage leaves, scale leaf, bulbils, male cone (specimen); Microsporophyll, megasporophyll mature seed.

(ii) Study through permanent slides—normal root (T.S.), stem (T.S.) (if sections are not available show photographs), ovule (L.S.). (iii) Study through hand sections or dissections-coralloid root (T.S.), rachis (T.S.), leaflet (V.S.), microsporophyll (V.S.), pollen grains (W.M.).

Pinus

(i) Habit, long and dwarf shoot showing cataphylls and scale leaves, T.S. wood showing growth rings, male cone, 1st year, 2nd year and 3rd year female cones, winged seeds.

(ii) Study through permanent slides-root (T.S.), female cone (L.S.) ovule (L.S.), embryo (W.M.) showing polycotyledonous condition.

(iii) Study through hand sections or dissections-young stem (T.S.), old stem (wood) (T.L.S. and R.L.S.), needle (T.S. male cone (L.S.), male cone (T.S.), Pollen grains (W.M.).

Ephedra

(i) Habit and structure of whole and female cones.

(ii) Permanent slides-female cone (L.S.).

(iii) Hand sections/dissections-node (L.S.), internode (T.S.), macerated stem to see vessel structure; epidermal peel mount of vegetative parts to study stomata, male cone (T.S. and L.S.), Pollen grains.

Ginkgo

(i) Habit and structure of whole plant.

(ii) Permanent slides-male and female reproductive parts.

(iii) Pollen grains

Suggested Readings:

1. Angiosperm Phylogeny Group (2003). An update of the Angiosperm Phylogeny Group Classification for the orders and families of the flowering plants: APG

2. Botanical Journal of the Linnaean Society 141: 399-436. 2. Cronquist, A. (1981). An Integrated System of Classification of Flowering Plants. Columbia University Press, New York.

3. Simpson, M.C. (2006). Plant Systematics. Elsevier, Amsterdam

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(THEORY)

Course Outcomes:

After passing this course the student will be able to:

CO1: Understand the quality control in food industry and quality attributes.

CO2: Learn about quality assessment methods in different food industries.

CO3: Understand the sampling techniques and sensory evaluation of food.

CO4: Understand the concept of HACCP, GMP and food laws and regulations.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(THEORY)

Examination Time: 3 Hrs
Credits (L-T-P): 4-0-0

Max. Marks: 100
Theory Marks: 60
Practical Marks: 20
CA: 20

Instructions for the Paper Setter: Eight questions of equal marks (12 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

1. Objectives, importance and functions of quality control
2. Quality attributes
3. Quality control in food industry-methods of evaluation and control of the various aspects of quality of raw materials, manufacturing process and the testing of finished products.

UNIT-II

4. Methods of quality assessment of food materials: fruits, vegetables, cereals, dairyproducts, meat, egg and processed products.
5. Color: Definition, importance, different color measuring instruments used in food industries.
6. Texture: Definition, importance, different texture analyzing instruments used in food industries to analyze texture.

UNIT-III

7. Sampling, specifications of raw materials and finished products
8. Sensory evaluation.

UNIT-IV

9. Concept of HACCP and GMP.
10. Food Laws and Regulations- FSSAI, AGMARK, FPO, PFA, MFPO, BIS, ISO.

Recommended Books:

1. Quality Control for Food Industry by A. Kramer and B.A. Twigg
2. Handbook of analysis and quality control for fruits and vegetable products by S.Ranganna
3. Food Science by N.N. Potter (Online Available) https://hostnezt.com/cssfiles/gsa/Food%20Science%205th%20Ed%20By%20Norman%2 0Potter.pdf

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(PRACTICAL)

Course Outcomes:

After passing the course student will be able to:

CO1: Familiarity with various platform tests used for assessing milk quality.

CO2: Understanding of food adulteration through various chemical and physical tests.

CO3: Understanding of the canning process and its importance in preserving fruits and vegetables.

CO4: Understanding of the concept of food quality and the importance of various chemical and physical tests in assessing it.

BACHELOR OF SCIENCE (MEDICAL) SEMESTER–IV (SESSION 2024-25)
FOOD SCIENCE AND QUALITY CONTROL (VOCATIONAL)
Course Title: Quality Assurance
Course Code: BSMM-4255 (P)
(PRACTICAL)

Time: 3 hrs **Max. Marks: 20**
Credits (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.

List of Practicals:

1. Determination of acidity and pH of milk.
2. Platform tests for determining the quality of milk.
3. Determination of cooking quality of rice.
4. Determination of iodine value of oil/fat.
5. Determination of saponification value of oil/fat.
6. Determination of reducing and non-reducing sugars.
7. Determination of interior and exterior quality of eggs.
8. Determination of alcoholic acidity of flour.
9. Adulterants in milk, cereals, oils and fats and their detection.
10. Cut out analysis of canned fruits and vegetable