

KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)

SCHEME AND CURRICULUM OF EXAMINATION OF TWO YEAR DEGREE PROGRAMME

(Under Credit Based Continuous Evaluation Grading System) (CBCEGS)

Master of Science (Chemistry)

Session: 2023-24

Semester-II										
Course Code	Course Title	Course Type	Hours Per week	L-T-P	Total Credits	Marks				Examination time (in Hours)
						Total	Th.	P	CA	
MCHL-2336	Mathematics for Chemists	E	2	2-0-0	2	50	40	-	10	3

E- Elective

Master of Science (Chemistry) Semester-II
Session 2023-24
Course Title: Mathematics for Chemists
Course Code-MCHL-2336
Course Outcomes

After the successful completion of this subject, the students should be able to:

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

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

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

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

Master of Science (Chemistry) Semester-II
Session 2023-24
Course Title: Mathematics for Chemists
Course Code-MCHL-2336

Examination Time: 3 Hours

Max. Marks: 50

LT P

Theory: 40

2 0 0

CA: 10

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

Trigonometry and Determinants:

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

Unit-II

Matrices:

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

Unit-III

Differential Calculus

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

Unit-IV

Integral Calculus

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

Reference Books:

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