

DEVI AHILYA VISHWAVIDYALAYA, INDORE

M.Sc. CHEMISTRY (SEMESTER – I)

Paper No.	: V [Code-405(a)]
Compulsory / Optional	: Compulsory
Max. Marks	: 100

Paper – V : (a) Mathematics For Chemists

(For students without Mathematics in B.Sc.)

Unit – I	Vectors Vectors, dot, cross and triple products etc. gradient, divergence and curl, Vector Calculus. Matrix Algebra Addition and multiplication; inverse, adjoint and transpose of matrices.
Unit – II	Differential Calculus Functions, continuity and differentiability, rules for differentiation, applications of differential calculus including maxima and minima (examples related to maximally populated rotational energy levels, Bohr's radius and most probable velocity from Maxwell's distribution etc.).
Unit – III	Integral Calculus Basic rules for integration, integration by parts, partial fractions and substitution. Reduction formulae, applications of integral calculus. Functions of several variables, partial differentiation, co-ordinate transformations (e.g. Cartesian to spherical polar).
Unit – IV	Elementary Differential equations First-order and first degree differential equations, homogenous, exact and linear equations. Applications to chemical kinetics, secular equilibria, quantum chemistry etc. second order differential equation and their solutions.
Unit – V	Permutation and Probability Permutations and combinations, probability and probability theorems average, variance root means square deviation examples from the kinetic theory of gases etc., fitting (including least squares fit etc with a general polynomial fit).

Books suggested

1. The chemistry Mathematics Book, E.Steiner, Oxford University Press.
2. Mathematics for chemistry, Doggett and Suicliffe, Logman.
3. Mathematical for Physical Chemistry : F. Daniels, Mc. Graw Hill.
4. Chemical Mathematics D.M. Hirst, Longman.
5. Applied Mathematics for Physical Chemistry, J.R. Barante, Prentice Hall.
6. Basic Mathematics for Chemists, Tebbutt, Wiley.