

FIRST ALLIED PAPER – II
MATHEMATICS – II : INTEGRAL CALCULUS & DIFFERENTIAL EQUATIONS.

UNIT – I

Properties of Definite integrals – Fundamental theorem of Integral calculus – change of variable and special methods of integration – Improper integrals – problems – Multiple integrals – Fourier series – Dirichlet's conditions – odd and even functions – sine and cosine series and problems to the relevant concepts only.

UNIT – II

Vector Differentiation – ordinary derivatives of vectors – space curves – differentiation formula – Partial derivatives of vectors – differentials of vectors – problems relevant to the above concepts – the vector differential operator DEL – gradient divergence and curl-formula involving the operator DEL – problems relevant to the above concepts.

UNIT – III

Vector integration – line surface and volume integrals – problems – statements (only) of the Gauss Divergence theorem, Green's theorem in plane and the stoke's theorem (No Proof). Verification of the above theorems and applications of the theorems for evaluating the line, surface and volume integrals.

UNIT – IV

First order first degree ordinary differential equations – Linear equations – Bernoulli's equations – Equations of first order but of higher degree – simultaneous linear differential equations – second order differential equations with constant and variable coefficient.

UNIT – V

Laplace transforms – conditions for the existence of the Laplace Transforms – General theorems – Inverse transforms – solving the second order ordinary differential equations with constant coefficients using the Laplace transforms.

Text Book Recommended:

1. Advanced calculus: Murray Spiegel, Schaum's Out line series, Asian student edition, McGraw Hill Book company, Singapore (1981) (Relevant topics from Chapters 5,9,14).
2. Vector Analysis: Murray Spiegel, Schaum's outline series, Asian student edition, Mc Graw Hill Book Company, Singapore (1981) (Relevant topics from Chapters 3,4,5,6).
3. Differential Equations: Narayanan and Manicavasogam Pillay, S.. (Printers and publishers), Madras (1991)