

PAPER - II DIFFERENTIAL EQUATIONS

Note : The question paper will be divided into three sections A, B and C as follows:

Section A : In this section, ten questions will be set taking two questions from each unit. Each question will be of short answer type not exceeding 20 words and will carry $3/4$ mark. The candidate will be required to attempt all the questions (aggregating 7.5 marks).

Section B : In this section, ten questions will be set taking two questions from each unit. The answer of each will not exceed 250 words or two and a half page. Each question will be of 7.5 marks. The candidate will be required to attempt five questions in all taking one question from each unit (aggregating 37.5 marks).

Section C : In this section, four questions will be set covering all the five units and whose answers shall not exceed 500 words or five pages each. Each question may have sub parts in it and will carry 15 marks. The candidate will be required to attempt any two questions (aggregating 30 marks).

UNIT - I

Exact differential equations and equations of special forms. Simultaneous differential equations. Total differential equations.

UNIT - II

Linear differential equations of second order and their solutions by :

- (i) The method of finding an integral of the C.F. by Inspection,
- (ii) Changing of independent variables,
- (iii) Removal of the first derivative,
- (iv) Operational factors,
- (v) Undetermined coefficients and
- (vi) Variation of parameters.

UNIT - III

Linear partial differential equations of first order : Lagrange's method, Integral surfaces passing through a given curve, orthogonal surfaces, Geometric description of $Pp+Qq=R$. Linear equations involving more than two variables. Non-linear partial differential equations of order one : Special methods of solution applicable to certain standard forms.

UNIT - IV

Charpit's method of solving non linear partial differential equations of first order, Monge's method for the integration of equations $Rr + Ss + Tt = V$.

Linear partial differential equations with constant coefficients, homogeneous equations with constant coefficients and non homogeneous equations with constant coefficients.