

HARINGHATA MAHAVIDYALAYA  
SEM-II 2<sup>nd</sup> INTERNAL ASSESSMENT-2019  
B.SC (Gen.)

SUB:MATH-G-CC-T-02

SUBJECT TITLE: Differential Equations

Coverage: Linear homogenous equations with constant coefficients, Linear non-homogenous equations, The method of variation of parameters, The Cauchy-Euler equation, Simultaneous differential equations, Total differential equations. Order and degree of partial differential equations, Concept of linear and non-linear partial differential equations. Formation of first order partial differential equations, Linear partial differential equation of first order, Lagrange's method, Charpit's method.

Submission from 22.05.2019 to 31.05.2019

Answer any two questions

Maximum Marks :10

1. Using the method of variation of parameter, solve

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} + y = xe^x \sin x, \text{ with } y(0) = 0 \text{ and } \left(\frac{dy}{dx}\right)_{x=0} = 0.$$

2. Solve  $\frac{dx}{dt} + 2\frac{dy}{dt} - x + y = 0$  and  $2\frac{dx}{dt} + \frac{dy}{dt} + 2x + y = 3e^{-t}$
3. Using Lagrange's method, solve  $z(z^2 + xy)(px - qy) = x^4$ .
4. Find a complete integral of  $q = 3p^2$ .