

Note:-1) Attempt any five questions

2) Each questions carry equal marks.

Q.1) Solve  $(D^3 - 7D - 6)y = (1 + x^2)e^{2x}$ .

Q.2) Solve  $(x - 2e^y)dy + (y + x \sin x)dx = 0$

Q.3) Solve  $(y + \frac{1}{3}y^3 + \frac{1}{2})dx + \frac{1}{4}(x + xy^2)dy = 0$

Q.4) Solve by Euler Method  $\frac{dy}{dx} = x^2 + y^2$  &  $y = 1$  <sup>at (0)</sup> <sup>for</sup> when  $x = 1$  in five steps.

Q.5) Use Runge Kutta method of fourth order to find an approximate value of  $y$  given  $\frac{dy}{dx} = 1 + y^2$ ,  $x_0 = 0$ ,  $y_0 = 0$  at  $x = 0.2$ .

Q.6) Solve by using Taylor's series method  $\frac{dy}{dx} = -xy$  with  $x_0 = 0$ ,  $y_0 = 1$

Q.7) Solve by Variation on Parameter method

$$\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{e^x}$$

Q.8) Solve  $(D^3 - D)y = 2e^x + 2x + 1$

Q.9) Solve  $x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 5y = \sin(\log x)$

Q.10) Solve  $xy(1 + xy^2) \frac{dy}{dx} = 1$