

**SESSIONAL EXAMINATION**  
**DGIT**  
**THIRD SEMESTER [B.TECH] JAN'21**

**Paper Code: BSC-MATH-203G**

**Subject: Mathematics-III**

**Time: One Hour Thirty Minutes**

**Max. Marks: 30**

**Note: Attempt any *three* questions including Q.no. 1 which is compulsory. All questions carry equal marks.**

Q.1. Attempt any two questions from the following questions: (2 X 5 = 10)

a. Solve  $x dy - y dx = (x^2 + y^2) dx$

b. Solve  $x^2 y'' + 4xy' + 2y = 0$

c. Solve by method of variation of parameters:  $y'' + 4y = 4 \sec^2 2x$

d. Solve  $x \log x \frac{dy}{dx} + y = 2 \log x$

e. Solve  $(x y^3 + y) dx + 2(x^2 y^2 + x + y^4) dy = 0$

Q.2. (a) Solve  $(D - 2)^2 y = 8(e^{2x} + \sin 2x + x^2)$  (10)

OR

(b) Solve  $x^2 y'' - x y' - 3y = x^2 \log x$  (10)

Q.3. (a) Solve  $\frac{dy}{dx} + \frac{1}{x} = \frac{e^y}{x^2}$  (10)

OR

(b) Solve the following simultaneous equations:  $\frac{dx}{dt} + y = \sin t$ ,  $\frac{dy}{dt} + x = \cos t$ ,

$y(0) = 0, \quad x(0) = 2$

(10)

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