**CBCS/ SEMESTER SYSTEM**

**(W.e.f 2020-21 Admitted Batch)**

**B.A./B.Sc. MATHEMATICS**

**COURSE-I, DIFFERENTIAL EQUATIONS MATHEMATICS MODEL PAPER**

**Time: 3Hrs Max.Marks:75M**

**SECTION - A**

**Answer any FIVE questions. Each question carries FIVE marks5 X 5 M=25 M**

1. Solve (1 + 𝑒𝑥/𝑦) 𝑑𝑥 + 𝑒𝑥/𝑦

(1 −

𝑥) 𝑑𝑦 = 0.

𝑦

2. Solve (𝑦 − 𝑒sin−1 𝑥) 𝑑𝑥 + √1 − 𝑥2 = 0

𝑑𝑦

3. Solve y + px = p2x4.

4. Solve (px − y)(py + x) = 2p

5. Solve (D2 − 3D + 2) = cosh x

6. Solve(D2 − 4D + 3)y = sin 3x cos 2x.

7. Solve d2y − 6 dy + 13y = 8e3X sin 2x.

dX2 dX

8. Solve x2y′′ − 2x(1 + x)y′ + 2(1 + x)y = x3

**SECTION - B**

**Answer ALL the questions. Each question carries TEN marks. 5 X 10 M = 50 M**

9 a) Solve x dy + y = y2 log x.

dX

(Or)

9 b) Solve (y + 1 y3 + 1 x2) dx + 1 (x + xy2) dy = 0.

3 2 4

10 a) Solvep2 + 2pycotx = y2.

(Or)

10 b) Find the orthogonal trajectories of the family of curves

𝑥2⁄3 + 𝑦2⁄3 = 𝑎2⁄3 where ‘a’ is the parameter.

11 a) Solve(D3 + D2 − D − 1)y = cos 2x. 11 b) Solve(D2 − 3D + 2)y = sin e−X.

(Or)

12 a) Solve (D2 − 2D + 4)y = 8(x2 + e2X + sin 2x)

(Or)

12 b) d2y + 3 dy + 2y = xeX sin x

dX2 dX

13 a) Solve (D2 − 2D)y = ex sin x by the method of variation of parameters.

(Or)

13 b) Solve 3𝑥2 d2y + x dy + y = x

dX2 dX