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| SEMESTER | II | QP CODE | 23MAT21 |
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P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA  
SEM END EXAMINATIONS APRIL -2025

I B.SC : MATHEMATICS: COURSE 3-DIFFERENTIAL EQUATIONS & PROBLEM  
SOLVING SESSION

TIME: 2 HRS

|                |                 |        |    |   |   |   |    |           |    |
|----------------|-----------------|--------|----|---|---|---|----|-----------|----|
| DATE & SESSION | 23.04.2025 & FN | REG NO | 24 | M | A | T | 38 | MAX MARKS | 50 |
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### SECTION - I

Answer any THREE questions by attempting at least One question from each section  
3×10= 30M

#### PART - A

1. Solve  $x^2 y dx - (x^3 + y^3) dy$
2. Solve  $(1 - x^2) \frac{dy}{dx} + 2xy = x\sqrt{1 - x^2}$
3. Solve  $P^2 + 2p \cot x = y^2$ .

#### PART - B

4. Solve  $(D^2 + 4)y = e^x + \sin 2x + \cos 2x$
5. Solve  $(d^2 - 4D + 4)y = 8x^2 e^{2x} \sin 2x$
6. Solve  $[(1 + x)^2 D^2 + (1 + x)D + 1]y = 4 \cos \log(1 + x)$

### SECTION - II

Answer any FOUR Questions.

4×5=20M

7. Solve  $x dy - y dx = xy^2 dx$
8. Solve  $x \frac{dy}{dx} + y = y^2 \log x$
9. Solve  $y = 2xP + x^2 P^4$
10. Solve  $(y - xp)(p - 1) = p$
11. Solve  $(D^2 - 5D + 6)y = e^{4x}$
12. Solve  $\frac{d^2 y}{dx^2} - 6 \frac{dy}{dx} + 13y = 8e^{3x} \sin 2x$
13. Solve  $(D^2 + a^2)y = \tan ax$  by method of variation of parameter.