

SEMESTER	II	QP CODE	23MAT21
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P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
SEM END EXAMINATIONS MAY -2024
I B.SC. MATHS HONS SUBJECT: DIFFERENTIAL EQNS & PROBLEM
SOLVING SESSIONS

DATE & SESSION	05.06.2024 FN	REG NO									MAX MARKS	50
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SECTION-A

Answer any **THREE** of the following questions. Must attempt at least one question

from each part. Each question carries 10 Marks.

3 X10 M = 30 M

PART-I

1. Solve $x^2y \, dx - (x^3 + y^3)y = 0$.

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

3. Solve $p^2 + 2p \cot x = y^2$.

PART-II

4. Solve $(D^2 - 4D + 3)y = \sin 3x \cos 2x$.

5. Solve $(D^2 - 4D + 4)y = 8x^2 e^{2x} \sin 2x$.

6. Solve $x^2 \frac{d^2y}{dx^2} - x \frac{dy}{dx} + 4y = \cos(\log x) + x \sin(\log x)$.

SECTION-B

Answer any **FOUR** questions. Each question carries 5 marks.

4X 5M = 20M

7. Solve $(1 + e^{x/y}) dx + e^{x/y} \left(1 - \frac{x}{y}\right) dy = 0$.

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

9. Find the orthogonal trajectories of the family of curves $r = a(1 + \cos \theta)$

• where 'a' is a parameter.

10. Solve $y = 2px + p^4 x^2$.

11. Solve $(D^2 - 3D + 2)y = \cosh x$.

12. Solve $(D^2 - 4D + 4)y = x^3$.

13. Solve $\frac{d^2 y}{dx^2} + 4y = \tan 2x$ by the method of variation of parameters.