

RAN-2403000503023001
S.Y.B.Sc. (NEP)(Sem. - III) Examination November - 2025
Major - 2 - 302 - Mathematics : Differential Equations (Paper - VI)
Time: 1 Hour]
[Total Marks: 25
સૂચના : / Instructions

- (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book
- (2) All questions are compulsory.
- (3) Figures to the right indicate marks of the corresponding question.

Seat No.:

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Student's Signature

Q. 1 Answer any FIVE from the following questions
05

1. Solve: $x^2y'' + 3xy' + y = 0$.
2. Convert $(1 - 3x)^2 y'' - (1 - 3x) y' + 3y = -3x + 1$ into a homogeneous linear differential equation.
3. Find the known integral for $y'' - (\sin x) y' - (1 + \sin x) y = 0$.
4. Obtain the partial differential equation by eliminating arbitrary constants a and b from $z = ae^x + be^{-y}$.
5. Find the complete integral of $z - p - q = px + qy$.
6. Find the complete integral of $p^2 + q^2 = 1$.

Q. 2 Answer any TWO from the following questions
10

1. Solve: $(x + a)^2 y'' - 4(x + a) y' + 6y = x$.
2. Solve: $y'' + \frac{2}{x} y' - n^2 y = 0$.
3. Solve: $y'' + (\tan x) y' + (\cos^2 x) y = 0$.

Q. 3 Answer any TWO from the following questions
10

1. Obtain the partial differential equation by eliminating arbitrary functions f and ϕ from $z = f(ax + by) + \phi \{ax - by\}$.
2. Solve: $x(y - z)p + y(z - x)q = z(x - y)$.
3. Discuss the method to solve the standard form $F(p, q) = 0$.