RAN-2403000503023001

RAN-2403000503023001

S.Y.B.Sc. (NEP) (Sem.-III) Examination March - 2026

Major-2-302-Mathematics Paper-VI (Differential Equations)

ક

Time: 1 Hours] **[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.:

Student's Signature

Q.1. Answer any FIVE from the following questions. **05**

1. Find the general solution of $x^2 \frac{d^2y}{dx^2} + y = 0$.
2. Find Q_1 while solving the differential equation $\frac{d^2y}{dx^2} + \frac{2}{x}\frac{dy}{dx} - n^2y = 0$ by using the method of removal of first-order derivative.
3. Find the known integral of a linear differential equation
$y'' + (1 - cot\ x)y' - y\ cot\ x = 0$
4. Obtain a partial differential equation by eliminating the arbitrary constants a and b from the relation $z = (x + a)\ (y + b)$.
5. Solve : $p + q = \frac{z}{a}$.
6. Find the complete integral of $z = px + qy + (p^2 + q^2)$.

Q.2. Answer any TWO from the following questions **10**

1. Discuss the method to transform a homogeneous linear differential equation with variable coefficients into a linear differential equation with constant coefficients by changing the independent variable.
2. Solve $(1 + 2x)^2 \frac{d^2y}{dx^2} - 6(1 + 2x)\frac{dy}{dx} + 16y = 8(1 + 2x)^2$.
3. Solve : $x^2y'' - 3xy' + 4y = x^2 logx$.

Q.3. Answer any TWO from the following questions **10**

1. Solve : $p^2 + q^2 = m^2$
2. Solve : $pz - qz - z^2 + (x + y)^2$.
3. Discuss the method to solve the first-order non-linear partial differential equation of the form $F(z, p, q) = 0$.