

RAN-2503000504013001
S.Y.B.Sc. (NCF-NEP) (Sem.-IV) Examination April - 2026
Numerical Methods-II (Major - Paper - VIII)
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 full marks of the question. (4) Follow usual notations.	Seat No.: Student's Signature
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Q.1. Answer any five from the followings. 05

1. How many data points are required to construct a Lagrange interpolation polynomial of degree 5?
2. Write the first divided difference for two points x_3 and x_4 .
3. How many subintervals are required for the trapezoidal rule?
4. What is numerical integration?
5. State the formula for finding first order derivative at the point $x = x_n$
6. Write the formula of Picard's approximation method

Q.2. Answer any two from the followings. 10

1. Derive Lagrange's Interpolation formula.
2. Derive the formula to find the second order differentiation at the point $x = x_0$.
3. Using the Lagrange's interpolation formula express $\frac{x^2 + 3x + 2}{(x-1)(x-2)(x-3)}$ as the sum of partial fractions.

Q.3. Answer any two from the followings. 10

1. Define initial value problem and explain Picard's approximation Method.
2. Explain Euler's Method to solve initial value problem $\frac{dy}{dx} = f(x, y); y(x_0) = y_0$
3. Find the value of $\int_0^1 \frac{1}{1+x} dx$ using trapezoidal rule (take $h = \frac{1}{6}$).