

SEMESTER	VI	QP CODE	6201
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P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
SEM END EXAMINATIONS APRIL -2025

III B.SC:MATHEMATICS: NUMERICAL METHODS

TIME: 2 HRS

DATE&SESSION	01-04-2025	REG NO								MAX MARKS	50
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SECTION-I1

Answer any **THREE** of the following questions. And attempt one question from Each section
part Each question carries **TEN** marks **3X10=30Marks**

PART-A

1. State and prove Newton's – Gregory formula for forward interpolation with equal intervals
2. Apply Stirling's formula to find y_{28} given that $y_{20} = 49225$, $y_{25} = 48316$, $y_{30} = 47236$, $y_{35} = 45926$, $y_{40} = 44300$
3. State and prove Netown's divided difference formula

PART-B

1. Find the maximum and minimum values of the function $y = f(x)$ from the following table

x	0	1	2	3	4	5
f(x)	0	0.25	0	2.25	16	56.25

2. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's 1/3 and 3/8 rule. Hence obtain the approximate value of π in each case
3. Given $\frac{dy}{dx} = y - x$ with $y(0) = 2$ find $y(0.1)$ and $y(0.2)$ correct to four decimal places by Runge-Kutta method.

SECTION-II

Answer any **FOUR** of the following questions. Each question carries **FIVE** marks

4 X 5=20Marks

4. Prove that i) $u_3 = u_2 + \Delta u_1 + \Delta^2 u_0 + \Delta^3 u_0$ and ii) $u_4 = u_3 + \Delta u_2 + \Delta^2 u_1 + \Delta^3 u_1$

5. Find the missing term in the following data

X	0	1	2	3	4
Y	1	3	9	-	81

6. Find the third divided difference with arguments 2, 4, 9, 10 of the function $f(x) = x^3 - 2x$
7. By Lagrange's interpolation formula, find the form of the function given by

X	0	1	2	3	4
f(x)	3	6	11	18	27

8. Find $f'(5)$ from the following table.

X	1	2	4	8	10
f(x)	0	1	5	21	27

9. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Weddle's rule
10. Solve $\frac{dy}{dx} = 1 + y^2, y(0) = 0$ by Picard's method