

SEMESTER	III	QP CODE	23MAT32
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P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
SEMESTER END EXAMINATIONS NOV -2024
II BSC MATHEMATICS : NUMERICAL METHODS & PROBLEM SOLVING
SESSIONS

DATE & SESSION	18.11.2024 AN	REG NO	232MA724	MAX MARKS	50
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SECTION-A

Answer any three questions. Selecting at least one question from each part

Part - I

3 X 10 = 30

1. Obtain the estimate of the missing terms in the following data.

x	1	2	3	4	5	6	7	8
f(x)	1	8	?	64	?	216	343	512

2. State and prove Newton's - Gregory formula for forward interpolation with equal intervals
3. From the following table, find the number of students who obtain less than 56 marks.

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

Part - II

4. Apply Gauss forward formula to find the value of u_9 if $u_0 = 14$, $u_4 = 24$, $u_8 = 32$, $u_{16} = 40$.
5. Find a real root of the equation $\cos x = 3x - 1$, correct to three decimal places, using iteration method.
6. Determine the constants a and b by the least squares method such that $y = ae^{bx}$, fits the following data.

x	1.0	1.2	1.4	1.6
y	40.170	73.196	133.372	243.02

SECTION-B

Answer any four questions

4 X 5 M = 20 M

7. Prove that (i) $\mu^2 = 1 + \frac{\delta^2}{4}$, (ii) $\Delta = \frac{\delta^2}{2} + \delta \sqrt{1 + \frac{\delta^2}{4}}$
8. Given $y_0 = 3$, $y_1 = 12$, $y_3 = 81$, $y_4 = 100$. Find $\Delta^4 y_0$ without forming difference table.
- $y_2 = 81$, $y_3 = 200$, $y_4 = 100$

9. Given

x	1	2	3	4	5	6	7	8
f(x)	1	8	27	64	125	216	343	512

Find $f(7.5)$

10. By means of Newton's divided difference formula, find the values of $f(8)$, $f(15)$ from the following table.

x	4	5	7	10	11	13
f(x)	48	100	294	900	1210	2028

11. Apply Stirling's formula to find y_{28} given that $y_{20} = 49225$, $y_{25} = 48316$, $y_{30} = 47236$, $y_{35} = 45926$, $y_{40} = 44300$.

12. Find the real root of the equation $x^2 - 5x + 2 = 0$ by Newton-Raphson's method.

13. Find the least square line $y = a + bx$ and $y(5)$ for the data.

x	0	2	5	7
y	-1	5	12	20