

SEMESTER	V	QP CODE	5201
 P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA SEM V EXAMINATIONS JANUARY -2024 III B.SC. SUBJECT: MATHEMATICS SEC A			
DATE & SESSION	23.01.2024 AN	REG NO	MAX MARKS

SECTION-A

Answer any **THREE** questions of the following by choosing atleast **ONE** from each section . Each question carries 10 marks.

3 X 10 M = 30 M

PART-A

1. State and prove Newton's – Gregory formula for forward interpolation with equal intervals. (BT-4)
2. Use Stirling's formula to find y_{28} , given $y_{20}=49225$, $y_{25}=48316$, $y_{30}=47236$, $y_{35}=45926$, $y_{40}=44306$. (BT-2)
3. State and prove Lagrange's interpolation formula? (BT-4)

PART-B

4. Using the given table, find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 2.2$. (BT-2)

x	1.0	1.2	1.4	1.6	1.8	2.0	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

5. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Weddle's rule? (BT-1)
6. 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 fourth order method. (BT-3)

SECTION-B

Answer any **FOUR** questions. Each question carries 5 marks.

4 X 5 M = 20 M

7. Prove that i) $\mu^2 = 1 + \delta^2/4$ ii) $\sqrt{1 + \delta^2 \mu^2} = 1 + \delta^2/2$.

(BT-2)

8. Find the missing term in the following data.

(BT-1)

x	0	1	2	3	4
y	1	3	9	-	81

9. Find $f(25)$ from the table by using Gauss forward interpolation formula. (BT-2)

x:	20	24	28	32
y:	14	32	35	40

10. Find the third divided difference with arguments 2, 4, 9, 10 of the function

(BT-2)

$$f(x) = x^3 - 2x.$$

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

(BT-2)

x	2	4	9	10
y	4	56	711	980

12. State and prove Trapezoidal Rule?

(BT-4)

13. Solve $\frac{dy}{dx} = 1 + y^2, y(0) = 0$ by Picards method.

(BT-2)