DECEMBER 2023 **U/ID 46507/UCC3C**

Time : Three hours Maximum : 75 marks

PART A — ($10 \times 2 = 20$ marks)

Answer any TEN questions.

1. Define: Absolute Error.

2. Define: Geometric mean.

3. What is Newton Raphson Method?

4. Write a Trapezoidal rule.

5. Define: Random Space.

6. Write the formula for Newton's Backward difference.

7. Write the multiplication Law of probability.

8. Define: Coefficient of correlation.

9. What is variance?

10. Define: Rank correlation coefficient.

11. State Rolle's Theorem.

12. Write Simpson's 1/3 rule.

PART B — ($5 \times 5 = 25$ marks)

Answer any FIVE questions.

13. Find a real root equation $x^2 - x - 1 = 0$ using bisection method.

14. Find a real root of the equation $x^3 - 2x - 5 = 0$ using secant method.

15. Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$, using Simpson's $\frac{1}{3}$ rule with $h = 0.125$.

16. Derive the Poisson Distribution.

17. Discuss the measures of central tendency.

18. Write the Algorithm for x^2 test.

19. Find the rank correlation coefficient for the following data

x	65	80	55	75	90
y	72	45	63	40	53

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

20. Solve the following equation using Gauss-Seidal Method.

$10x + 2y + z = 9$

$2x + 20y - 2z = -44$

$-2x + 3y + 10z = 22$

21. From the following table of values x and y, Find $\frac{dy}{dx}$ at $x = 2$ using the cubic spline method

x	2	3	4
y	11	49	123

22. Explain moments, in detail and write a program.

23. Discuss the hypergeometric distribution and write a program for the computation of Hyper geometric probability.

24. Briefly explain the following :

    (a) Binomial Distribution

    (b) Runge – Kutta method.
