MAY 2022 **U/ID 46507/UCC3C**

Time : Three hours Maximum : 75 marks

PART A — (10 × 2 = 20 marks)

Answer any TEN questions.

1. What is the major role of Numerical method?

2. Define Numerical differentiation.

3. What do you mean by Partial differential equation?

4. Write the formula for secant method.

5. Write the formula for Trapezoidal rule.

6. Define Probability of an event.

7. Define Conditional probability.

8. Define Quartile deviation.

9. Define Mode.

10. What is Regression?

11. What is the use of chi square test?

12. Write the types of correlation.

PART B — ($5 \times 5 = 25$ marks)

Answer any FIVE questions.

13. Find the root of the equation $x \sin x + \cos x = 0$.

14. Apply Simpson's Rule to evaluate $\int_0^2 \frac{dx}{1+x^3}$ correct to two decimal places, by divide the range into 4 equal.

15. Write Algorithm for Lagrange's interpolation.

16. Evaluate the solution at $x = .1, .2, .3$ of the following problem by second order Runge-Kutta method

$$y' = \frac{1}{2}(1+x)\, y^2,\ y(0) = 1$$

17. Write the merits and demerits of measures of Central tendency.

18. Find the probability of drawing a Queen, a king and knave in that order from a pack of cards in three consecutive draws, the card drawn not being replaced.

19. Find the mode of the following frequency distribution

x :	1	2	3	4	5	6	7	8
f :	4	9	16	25	22	15	7	3

PART C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

20. Solve the Gauss-elimination method.

$$2x_1 + x_2 + x_3 = 7$$
$$4x_1 + 2x_2 + 3x_3 = 4$$
$$x_1 - x_2 + x_3 = 0$$

21. Apply the Fourth order of Runge-Kutta method to find an approximation value of y, when $x = 2$, given that $y' = x + y, y(0) = 1$

22. Find the mean, standard deviation and variance for the following data :

Age in years	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of members :	3	61	132	153	140	51	2

23. Calculate the rank correlation coefficient for the following data

x :	80	78	75	74	68	67	60	59
y :	12	13	14	16	17	20	22	23

24. Discuss the basic principles and characteristics of Chi square test.

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