

# SECTION C — ( $3 \times 10 = 30$ )

Answer any THREE questions.

16. Solve the system of equation by Gauss-Jacobian method :

$$20x + y - 2z = 17 ; 3x + 20y - z = -18 ;$$

$$2x - 3y + 20z = 25 .$$

17. Find  $\frac{dy}{dx}$  for the value of time  $t = 1.6$  for a velocity function  $y$  given below :

|       |       |       |       |       |       |      |        |
|-------|-------|-------|-------|-------|-------|------|--------|
| $t :$ | 1     | 1.1   | 1.2   | 1.3   | 1.4   | 1.5  | 1.6    |
| $y :$ | 7.989 | 8.413 | 8.781 | 9.129 | 9.451 | 9.75 | 10.031 |

18. Solve by  $\frac{dy}{dx} = x^2 + y^2 + 1$ ,  $y(0) = 0$  to get  $y(0.1)$  using Picard's method.

19. Let A's chance of hitting a target is  $1/5$ , B's chance of hitting a target is  $1/4$  and C's chance of hitting a target is  $1/3$ . If they fire together, find the probability of one of them hitting the target.

20. Find correlation between height ( $X$ ) and weight ( $Y$ ) from the following data :

|       |    |    |    |    |    |
|-------|----|----|----|----|----|
| $X :$ | 60 | 63 | 65 | 64 | 68 |
| $Y :$ | 50 | 53 | 60 | 67 | 70 |

S.No. 5269

RACSY 75 C

(For candidates admitted from 2008 to 2015 Batch)

B.Sc. DEGREE EXAMINATION, APRIL 2022.

Part III — Allied

NUMERICAL METHODS AND STATISTICS

Time : Three hours

Maximum : 75 marks

## SECTION A — ( $10 \times 2 = 20$ )

Answer ALL questions.

1. Give an example of Algebraic equation.
2. Define Newton-Rapson method.
3. What do you mean by interpolation?
4. Define Simpson's  $1/3^{\text{rd}}$  rule.
5. What is OPE?
6. Write the formula for Euler method.
7. Define Probability.

8. What do you mean by expectation of a random variable?

9. What are different types of classification of data?

10. Define Quartile Deviation.

### SECTION B — ( $5 \times 5 = 25$ )

Answer ALL questions, choosing either (a) or (b).

11. (a) Compute the real root of  $x^3 - x - 4 = 0$  which lies between (1, 2) by False-Position method.

Or

(b) Compute the real root of equation  $3x - \cos x - 1 = 0$  by Newton-Rapson method.

12. (a) Find the value of  $A$  when  $t = 9$  using Newton's interpolation formula.

$t:$     2        5        8        11

$A:$  94.8   87.9   81.3   75.1

Or

13. (a) Explain Euler method of solving ordinary differential equation.

Or

(b) Applying Range-Kutta method of third order to find the value of  $y$  when  $x = 0.2$  for  $\frac{dy}{dx} = \frac{3x + y}{z}$  if  $y(0) = 1$ .

14. (a) State and prove Multiplication theorem in probability.

Or

(b) Write a brief note about discrete and continuous random variable.

15. (a) Explain briefly about classification of data.

Or

(b) Calculate Mean Deviation about Median for the following data :

$X:$  10   11   13   14   12

$f:$  3   12   12   3   18

(b) Evaluate  $\int_4^{5.2} \log_e x$  by Trapezoidal Rule by taking  $h = 0.2$ .