

23U310

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Name:

Reg.No:

THIRD SEMESTER B.Sc. DEGREE EXAMINATION, NOVEMBER 2024

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U BCA3 C05 - COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS

(Computer Application - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. Define absolute and relative errors.
2. Define forward and backward difference operator.
3. Write Newton's forward and backward difference formula.
4. Give the formula for Lagrangian interpolation.
5. Define trapezoidal rule.
6. Distinguish between population and sample with suitable examples.
7. Find the AM from the following table giving the marks of 38 students in an internal examination.

Marks	12	14	15	16	17	18	19	20
No. of Students	3	2	1	3	3	15	6	5

8. Define Coefficient of Variation. Give any one of its uses.
9. Write down the normal equation to fit a straight line.
10. State the merits and demerits of Rank correlation method.
11. Define independent and dependent events.
12. Distinguish between discrete and continuous random variables.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer *all* questions. Each question carries 5 marks.

13. Solve $x^3 - 9x + 1 = 0$ for the roots between $x=2$ and $x=4$ by bisection method.
14. Find the value of $\sqrt{2}$. Correct to 4 decimal places using Newton Raphson method.
15. Evaluate the integral $\int_0^1 \frac{dx}{1+x}$ using Simpson's 1/3 rule with $n=4$. Also compare it with its original value.

16. Calculate median and mode.

Central wage in Rs.	15	20	25	30	35	40	45
No. of wage earners	3	25	19	16	4	5	6

17. Find the median and the 20th percentile for the following.

Class	0-5	5-10	10-15	15-20	20-25	25-30
Frequency	7	18	25	30	20	22

18. Calculate quartile deviation for the following data.

Class interval	0-20	20-40	40-60	60-80	80-100
Frequency	8	21	35	31	5

19. What is a scatter diagram? What are its merits and demerits?

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Calculate Karl Pearson's coefficient of correlation from the following data.

X	43	44	46	40	44	42	45	42	38	40	42	57
Y	29	31	19	18	19	27	27	29	41	30	26	10

Also comment on the result obtained.

21. The distribution function of a random variable X is given by

$$F(x) = \begin{cases} \frac{1}{4}x(3x - x^2) & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases} \quad \text{find its p.d.f and obtain } P(0.5 \leq X \leq 1.5)$$

(1 × 10 = 10 Marks)
