

D3BCA1802 (S4)

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Reg. No.....

Name:

SECOND SEMESTER BCA DEGREE EXAMINATION, NOVEMBER 2023

BCA

CBCA3C05T-COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS

Time: 3 hours

Maximum Marks: 80

Answer all questions. Each carries 1 mark

1. How to find error in bisection method?
2. Calculate range for the following
156, 165, 148, 147, 162, 151
3. Which are the methods available for interpolation?
4. What is quartile?
5. What is the formula used for finding Mode?
6. Define probability.
7. What is Regression analysis?
8. Define sample space.
9. If $f(x)$ is a probability density function of a continuous random variable,
then $\int_{-\infty}^{\infty} f(x) dx = ?$
10. Define random variable.

(10 x 1=10 Marks)

Answer all questions. Each carries 2 marks

11. Give the formula used in False Position Method.
12. What is computational error? Write one example.
13. How is Newton Interpolation better than Lagrange formula?
14. Find Median weight from the following
75, 71, 73, 70, 74, 80, 85, 81, 86, 79
15. Differentiate between Exhaustive event and Independent event.
16. What is probability distribution with example?
17. Define Discrete variable and give two examples.
18. If the regression coefficients are 0.8 and 0.2, what would be the value of coefficient of correlation?

(8x2=16 Marks)

Answer any 6 questions. Each carries 4 marks

19. Find the root of the function $x^3 - 4$ using bisection method.
20. Let $A=0.325 \times 10^0$ $B= 0.245 \times 10^{-3}$ Find $A+B$.
21. Construct forward difference table
x: -1 0 1 2
f(x): -8 3 1 12

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22. The p.d.f. of a random variable X is given by $f(x) = kx(1-x); 0 \leq x \leq 1$

- (a) Find the value of k.
- (b) Obtain the distribution function of X.

23. Let X be jointly continuous random variable with joint PDF

$$f(x) = \begin{cases} cx^2 & 0 < x < 3 \\ 0 & \text{otherwise} \end{cases}$$

- a) Find the constant c
 - b) Compute $P(1 < X < 2)$
24. The average mark of 40 students of a class A is 38 and average mark of 60 students of a class B is 42. What is the average mark of the combined class?

25. Calculate Mean deviation and Coefficient of Mean deviation for the following data

Class : 0-10 10-20 20-30 30-40 40-50

Frequency: 5 15 17 11 2

26. Fit a straight line to the following data

X: 1 2 3 4 5

Y: 14 13 4 5 2

Estimate the value of Y when X= 3.5

27. What is the probability that a leap year selected at random will contain 53 Sundays.

(6x4=24 Marks)

Answer any 3 questions. Each carries 10 marks

28. Find the equation of the cubic curve that passes through the points

(-1,8), (0,3), (2,1), (3,2) using Lagrange's Interpolation formula.

29. Find the Harmonic mean and Geometric mean for the following data

Class : 10-20 20-30 30-40 40-50 50-60

Frequency: 4 6 10 7 3

30. Calculate Pearson's coefficient of correlation from the following

X: 104 111 104 114 118 117 105 108 106 100 104 105

Y: 57 55 47 45 45 50 64 63 66 62 69 61

31. a) Evaluate $\int_0^{\pi/2} \sin x \, dx$ using Simpson's 1/3rd rule.

b) Evaluate $\int_0^1 \frac{dx}{(1+x^2)}$ using trapezoidal rule with $h=0.2$

32. The joint density function of two continuous random variables X and Y is

$$f(x, y) = \begin{cases} cxy & 0 < x < 4, 1 < y < 5 \\ 0 & \text{otherwise} \end{cases}$$

- a) Find the value of the constant c.
- b) Find $P(X \geq 3, Y \leq 2)$.
- c) Find $P(1 < X < 2, 2 < Y < 3)$.

(3x10=30 Marks)