491

D3BCA1802 (S3) (PAGES 3) Reg. No.....

Name: .....

THIRD SEMESTER UG DEGREE EXAMINATION, NOVEMBER 2022

(Supplementary 2018 Admission)

BCA

CBCA3C05T: COMPUTER ORIENTED NUMERICAL & STATISTICAL METHODS

Time: 3 Hours **Maximum Marks: 80**

SECTION A: Answer *All* the questions. Each carries 1 mark.

1. Define relative error.
2. The arithmetic mean of n natural numbers from 1 to n is -------
3. Define median.
4. What is the order of the error in Simpson's 1/3 rule?
5. Write formula of correlation and regression.
6. What is discrete variable?
7. Write the formula for Newton's forward difference interpolation.
8. What is sample space?
9. Give an example of an algebraic equation.
10. What is probability density function?

(10 x 1 = 10 Marks)

SECTION B: Answer *All* the questions. Each carries 2 marks.

11. Calculate Arithmetic mean of 12, 18, 14, 15, 16.
12. Calculate coefficient range of the following data:

Mark	10-20	20-30	30-40	40-50	50-60
Number of students	8	10	12	8	4

13. Write different types of events.
14. Give classical definition of probability.
15. Find the relative error of the number 8.6 if both of its digits are correct.
16. Define random variable and give two examples.
17. Construct forward difference table for the following data

x	4	6	8	10
y	1	3	8	16

18. What is probability distribution with example?

(8 x 2 = 16 Marks)

(PTO)

SECTION C: Answer any *Six* questions. Each carries 4 marks.

19. Find solution of an equation $x^3-3x-5=0$ using bisection method.

20. Write Newton Raphson formula to obtain the cube root of N.

21. Find the Geometric mean of the following data:

Class	1-5	6-10	11-15	16-20
Frequency	2	8	3	7

22. Calculate coefficient of correlation using direct method

X	2	3	4	5	6	7	8
Y	4	7	8	9	10	14	18

23. Give the following probability distribution

x	0	1	2	3	4	5	6	7
P(x)	0	C	2 c	2 c	3 c	c^2	$2c^2$	$7c^2+c$

Find

(a) c

(b) $P(X\geq 5)$

24. Find the Lagrange's interpolation polynomial fitting the points f(0) = 2, f(1) =1, f(2) = 12

25. Let x be a continuous random variable with Probability Density Function

$$fx(x) = \begin{cases} 4x^3 & 0<x\leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Find $P(x\leq 2/3 \mid x>1/3)$.

26. Calculate quartile deviation and quartile coefficient of dispersion for the following data:

Class	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Frequency	6	18	25	50	37	30	24	10

27. Find the Spearman's rank correlation of the following ranks:

Rank 1	1	2	3	4	5	6	7	8	9	10
Rank 2	1	3	2	4	7	6	5	8	8	10

(6 x 4 = 24 Marks)

SECTION D: Answer any *Three* questions. Each carries 10 marks.

28. Find mean deviation about median of the following data:

Class	0-6	7-13	14-20	21-27	28-34	35-41
Frequency	8	17	28	15	9	3

And also find the coefficient of mean deviation.

29. A random variable X has the p.d.f. given by:

X	-3	-1	0	1	2	3
$F(x)$	k^2	$2k^2+k$	$2k^2+3k$	$4k^2+5k$	$3k^2+3k$	$2k^2+k$

(a) Find the value of k.

(b) Obtain the distribution function of X.

(c) Find P(X >1) and P(X≤2)

30. For the following table of values, estimate $f(7.5)$, using Newton's backward difference interpolation formula:

x	1	2	3	4	5	6	7	8
f(x)	1	8	27	64	125	216	343	512

31. A box contains 8 red, 3 green and 9 blue balls. If 3 balls are drawn at random, determine the probability that

(a) All 3 are red

(b) All 3 are green

(c) 2 are red and one is blue

(d) Atleast one is green

32. Evaluate $\int_0^{10} \frac{dx}{1+x^2}$ by Simpson's ⅓ rule taking h =1.

(3 x 10 = 30 Marks)