Reg. No…… Name……..…

BCA DEGREE END SEMESTER EXAMINATION - APRIL 2026

UGP (HONS.) SEMESTER - 2: CORE COURSE

COURSE: 24UBCADCC104 – STATISTICAL METHODS FOR COMPUTATIONAL ANALYSIS

(For Regular 2025 and Improvement/Supplementary 2024 Admission)

Time: 2 Hours Max. Marks - 70

(Use of non-programmable scientific calculator is permitted)

PART A

(Each question carries 2 marks. Maximum marks from this part is 10)

1. Define measure of central tendency. (CO1 U)
2. Give the application of the coefficient of variation. (CO2 R)
3. Evaluate the second central moment when it is given that the first two raw moments about zero are 10 and 2 respectively. (CO2 E)
4. Comment on the applications of scatter diagrams in the study of correlation analysis. (CO3 U)
5. Define mutually exclusive events. (CO4 U)
6. Evaluate P(A ∩ B) if it is given that P(A U B) = 0.85, P(A) = 0.45, P(B) = 0.50 (CO4 E)
7. Give two examples each for discrete and continuous random variables. (CO4 R)
8. Define moment generating function of a discrete random variable (CO6 U)

PART B

(Each question carries 5 marks. Maximum marks from this part is 30)

9. Evaluate the harmonic mean of the following data: 25, 30, 20, 15, 35, 45, 50. (CO1 E)
10. Given n=12, $\sum x = 96,\ \sum y = 84, \sum xy = 312, \sum x^2 = 1128, \sum y^2 = 1380$. Estimate the correlation coefficient between x and y. (CO3 E)
11. The mean and standard deviation of the runs scored by the cricket team sponsored by ABC corporation based on 22 matches is 340 and 50 respectively. The mean and standard deviation of the runs scored by the cricket team sponsored by XYZ corporation based on 28 matches is 408 and 50 respectively. Compare the stability of the teams in scoring the runs during the matches. (CO1 A)
12. State and prove the addition theorem of probability for two events. (CO4 R)

13. When two dice are thrown at a time, what is the probability that sum of numbers turning up is

    (i) greater than 10 (ii) at least 4 (CO5 E)

14. The probability mass function of a discrete random variable is given below: (CO5 E)

x	0	1	2	3	4	5	6	7
P(x)	c	2c	11c	19c	22c	15c	6c	2c

Evaluate (i) Value of c (ii) P (X < 3)

15. Define joint probability distribution of a pair of two discrete random variables. Give its properties.

(CO5 R)

16. Express the first four central moments in terms of the first four raw moments.

(CO6 U)

PART C

(Each question carries 15 marks. Maximum marks from this part is 30)

17. Obtain the regression equation of X on Y from the following data. (CO3 An)

x	12	15	20	23	27	30	41	50
y	20	17	25	30	28	34	35	52

18. Calculate Standard deviation and coefficient of variation from the following data.

Class	0 - 5	5 - 10	10 - 15	15 - 20	20 -25	25 - 30
f	7	13	29	31	15	5

(CO2 E)

19. (a) State and prove Bayes Theorem

(b) There are three boxes B1, B2 and B3, the contents of which are given below:

Box B1 – 8 Red and 7 White balls

Box B2 – 9 Red and 11 White balls

Box B3 – 10 Red and 10 White balls .

19. One box is selected at random and a ball is drawn from it. If the ball drawn is white, what is the probability that it was drawn from Box B3? (CO4 An)

20. The joint probability density function of two random variables is given as,

$f(x,y) = k (3x + 2y)$, $x = 1,2,3,4$ and $y = 1,2,3$

$= 0$, elsewhere

Obtain (i) value of k (ii) Marginal pdfs (iii) $f(x/y = 2)$ (iv) Check whether X and Y are independent. (CO5 A)