Roll No.

Total No. of Questions : 10] [Total No. of Printed Pages : 7

(2021)

BCA (CBCS) RUSA Vth Semester Examination

4051

COMPUTER ORIENTED STATISTICAL METHODS

BCA–0505

Time : 3 Hours] **[Maximum Marks : 70**

Note :– Part–A (both question No. 1 and 2) is compulsory. Attempt any *four* questions from Parts–B, C, D, and E, by selecting *one* question from each Part. Marks are indicated against each question.

Part–A

(Compulsory Question)

1. Answer the following questions as directed :

   (i) The most stable measure of central tendency is :

   (a) Mean

   (b) Median

   (c) Mode

   (d) Geometric mean (Choose correct option)

(ii) The geometric mean of the 2, 4, 16, 32, is ..... . (Fill in the blank)

(iii) Write a relation between Mean, Median and Mode.

(iv) $P(\varphi) = 0$, where (φ) is the null set.

(True/False)

(v) A single letter is selected at random from the word 'PROBABILITY'. What is the probability that the selected letter is vowel ?

(vi) Two coins are tossed simultaneously. What is the probability of having at least one head ?

(vii) The variance of a constant is zero, *i.e.* Var. (C) = 0. (True/False)

(viii) If X and Y are two independent random variables. Then Covariance (X, Y) $\neq$ 0.

(True/False)

(ix) The expected value of a random variable always exists. (True/False)

(x) The coefficient of dispersion (C.D.) based upon the standard deviation is given by; C.D. = Standard Deviation/Mean. (True/False)

1×10=10

2. Answer the following questions in **25** to **30** words :

(i) What is the role of computer in solving Statistical Problems ?

(ii) Find the simple and weighted arithmetic mean of the first n natural numbers. The weights are their corresponding numbers.

(iii) State and prove the multiplication theorem of probability (Considering only two events).

(iv) Discuss the merits and demerits of the geometric mean.

(v) Explain Karl Pearson's coefficient of correlation.

4×5=20

Part–B

3. (a) Find the mean of the following frequency distribution :

Turn Over

Marks	No. of Students
0—10	12
10—20	18
20—30	27
30—40	20
40—50	17
50—60	6

(b) Find the median wage of the following data :

Wages (in Rs.)	No. of Employees
20—40	8
40—60	12
60—80	20
80—100	30
100—120	40
120—140	35
140—160	18
160—180	7
180—200	5

5×2=10

4. For a group of 200 candidates, the mean and standard deviation of scores were found to be 40 and 15 respectively. Later on it was found that the scores 43 and 35 were wrongly entered as 34 and 53 respectively find calculating the mean and standard deviation. Find the correct value of the mean and standard deviation corresponding to the correct values of two entries. 10

Part–C

5. (a) If two dices are tossed simultaneously. What is the probability that the sum of the numbers coming upside on both the dice is greater than 8.

(b) In a single throw of three dices, what is the probability of getting a sum of the numbers coming upside on all dices equal to 5. 5×2=10

6. (a) A problem of Statistics is given to 3 students whose chances of solving the problem are 1/2, 1/3 and 1/4 respectively. Find the probability that the problem is solved.

(b) A bag contains 6 red, 5 white and 4 black balls. If two balls are drawn at random from the bag, find the probability that none of the balls drawn is red. 5×2=10

Part–D

7. (a) A coin is tossed until a head appeared. What is the expectation of tosses required ?

(b) Two random variables X and Y have the following joint probability density function :

$$f(x,y)=\begin{cases}2-x-y; & 0\le x\le 1,\quad 0\le y\le 1\\ 0; & \text{otherwise,}\end{cases}$$

Find :

(i) Marginal *p.d.f.* of X and Y

(ii) Var. (X), Var. (Y)

(iii) Cov. (X,Y) 5×2=10

8. A man with '*n*' keys wants to open his door and tries the bag independently at random. Find the mean and variance of the number of trials required to open the door, if :

(a) Unsuccessful keys are not eliminated from the further selection, and

(b) These keys are eliminated 10

Part–E

9. The joint probability distributions of X and Y is given as :

Y \ X	1	2
1	0.4	0.2
2	0.1	0.3

Find the correlation coefficient between X and Y. 10

10. Calculate the coefficient of correlation between X and Y for the following data :

X	–10	–5	0	5	10
Y	5	9	7	11	13

10

Roll No. .....

Total No. of Questions : 9] [Total No. of Printed Pages : 8

(2111)

BCA (CBCS) RUSA Vth Semester Examination

4522

COMPUTER ORIENTED STATISTICAL METHODS

BCA–0505

Time : 3 Hours] **[Maximum Marks : 70**

Note :– Section–I is compulsory. Attempt *one* question from each part of Section–II. Marks are indicated against the question.

Section–I

(Compulsory Question)

1. (A) Do as directed the following questions :

(i) The mean of 8, 11, 6, 14, x and 13 is 66. Find the value of the observation x.

(ii) If covariance between X and Y variables is 10 and the variances of X and Y are respectively 16 and 9, find the coefficient of correlation.

Turn Over

(iii) Does the following data have model weight of 8 students :

Weight : 1, 7, 2, 4, 5, 9, 8, 3.

(Yes/No)

(iv) What is the probability of picking a red or black card from a standard pack of 52 cards ?

(v) A fair die is tossed. Find the probability of getting a 4, 5 or 6 on the toss ?

(vi) A dealer in computers estimates from his past experience the probabilities of selling computers in a day, which are as follows :

No. of Computers	Probability
0	0.03
1	0.20
2	0.23
3	0.25
4	0.12
5	0.10
6	0.07

Find the expected value of computers sold in a day.

(vii) The range of a sample gives an indication of the :

(a) Way in which the values cluster about a particular point

(b) Number of observations bearing the same value

(c) Maximum variation in the sample

(d) Degree to which the mean value differs from its expected value

(Choose the correct one)

(viii) The median of the sample 5, 5, 11, 9, 8, 5, 8 is :

(a) 5

(b) 6

(c) 8

(d) 9

(Choose the correct one)

(ix) Define coefficient of variance.

(x) The coefficient of correlation lies between :

(a) 0 and +1

(b) −1 and 0

(c) −1 and +1

(d) 0 and −0.5 (Choose the correct one)

(B) (i) Define mutually exclusive and equally likely events. 1×10=10

(ii) Define geometric mean and its properties in short.

(iii) Write in short merits and demerits of mean deviation.

(iv) Explain briefly assumed Mean method for calculating standard deviation in discrete series.

4×5=20

Section–II

(Part–A)

2. Calculate Mean and Mode from the following data :

Marks above	No. of Students
10	77
20	72
30	65
40	55
50	43
60	28
70	16
80	10
90	8

10

3. Find Median and Standard Deviation from the following data :

x	f
0—10	12
10—20	17
20—30	23
30—40	39
40—50	16
50—60	03

10

(Part–B)

4. (a) If n persons are seated on n chairs at a round table, then find the probability that two specified persons are sitting next to each other.

(b) If 10 men, among whom are A and B, stand in a row, what is the probability that there will be exactly 3 men between A and B ? 5×2=10

5. (a) A bag contains 30 balls numbered from 1 to 30. One ball is drawn at random. Find the probability that the number of the ball drawn will be a multiple of 5 or 7.

(b) Find the probability of drawing a queen, a king or an ace in that order from a pack of cards in three consecutive draws, the cards drawn not being replaced. 5×2=10

(Part–C)

6. (a) A petrol pump proprietor sells on an average ₹ 80,000 worth of petrol on rainy days and an average of ₹ 95,000 on clear days. Statistics from Meteorological Dapartment show that the probability is 0.76 for clear weather and 0.24 for rainy weather on coming Monday. Find the expected value of petrol sale on coming Monday.

(b) A committee consisting of 2 computer analysts and 3 statisticians is to be formed, out of 5 computer analysts and 7 statisticians. In how many ways this can be done if (i) any computer analyst and any statistician can be included, (ii) one particular statistician must be on the committee. 5×2=10

7. Two cards are drawn (without replacement) from a well shuffled deck of 52 cards. Find the probability distribution and mean of number of cards numbered 4. 10

(Part–D)

8. Calculate coefficient of Karl Pearson's correlation of the following data :

Cost	Sales
39	47
65	53
62	58

90	86
82	62
75	68
25	60
98	91
36	51
78	84

9. Find the coefficient of correlation for the following data : 10

(1, 3), (2, 5), (3, 7), (4, 9), (5, 10), (6, 11), (7, 14), (8, 15), (9, 4), (10, 20).

10