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