Roll No. .....

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

(2102)

BCA (CBCS) RUSA Vth Semester Examination

4000

COMPUTER ORIENTED STATISTICAL METHODS

Paper : BCA-0505

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

Note :- Attempt any *five* questions. Attempt *one* question each from Parts B, C, D, and E. Marks are indicated against the question. Part A (both Q. Nos. 1 and 2) is compulaory.

Part–A

(Compulsory Questions)

1. Answer the following questions as directed :

   (i) Median is not affected by the extreme points.

   (True/False)

   (ii) The probability of any event is either zero or one.

   (True/False)

(iii) Coefficient of dispersion (C.D.) based upon quartile deviation is C.D. $= \dfrac{Q_3 - Q_1}{Q_3 + Q_1}$.

(True/False)

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

(a) Mean (b) Median

(c) Mode (d) None of these

(Choose the correct option)

(v) $P(\bar{A}) = 1 + P(A)$. (True/False)

(vi) A coin is tossed three times in succession, the number of sample points in sample space is :

(a) 6 (b) 8

(c) 3 (d) 9

(Choose the correct option)

(vii) In the simultaneous tossing of two perfect coins, the probability of having at least one head is :

(a) ½ (b) ¼

(c) ¾ (d) 1

(Choose the correct option)

(viii) The 'average' value of a random phenomenon is also termed as its expected value.

(True/False)

(ix) If X is a random variable, then $E(aX + bY) = aE(X) + bE(Y)$. (True/False)

(x) If $V(X) = 1$, then $Var(2X + 3)$ is 4.

(True/False)

1×10=10

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

(i) Explain the meaning of the word 'Statistics' as used in different sense.

(ii) Distinguish between absolute and relative measures of dispersion.

(iii) Discuss the merits and demerits of harmonic mean.

(iv) Give the classical and statistical definitions of probability.

(v) Explain the difference between product moment correlation coefficient and rank correlation coefficient.

4×5=20

Part–B

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

X	f
1	5
2	9
3	12
4	17
5	14
6	10
7	6

(b) Find the median for the following frequency distribution :

Variable	Frequency
10–20	12
20–30	30
30–40	34
40–50	65
50–60	45
60–70	25
70–80	18

2×5=10

4. From a sample of n observations, the arithmetic mean and variance are calculated. It is then found that one of the values, x_1, is the error and should be replaced by x_1'. Show that the adjustment to the variance to correct this error is :

$$\frac{1}{n}(x_1' - x_1)\left(x_1' + x_1 - \frac{x_1' - x_1 + 2T}{n}\right)$$

where T is the total of the original results. 10

Part–C

5. (a) A letter of English alphabet is chosen at random. Calculate the probability that the letter so chosen :

(i) is a consonant

(ii) precedes r (in alphabetical order)

(b) The probability that a student passes a Physics test is 2/3 and the probability that he passes both a Physics test and an English test is 14/45. The probability that he passes at least one test is 4/5. What is the probability that he passes the English test ? $2\times5=10$

6. (a) In a random arrangement of the letters of the word 'ENGINEERING', what is the probability that vowels always occur together ?

(b) A consignment of 15 record players contains 4 defectives. The record players are selected at random, one by one, and examined. Those examined are not pull back. What is the probability that the 9th one examined is the last defective ? 2×5=10

Part–D

7. An urn contains 7 white and 3 red balls. Two balls are drawn together at random from this urn. Compute the probability that neither of them is white. Find also the probability of getting one white, one red ball. Hence, compute the expected number of white balls drawn. 10

8. What is the expectation of the number of failures preceding the first success in an infinite series if independent trials with constant probability p of success in each trial ? 10

Part–E

9. Calculate the correlation coefficient for the following heights (in inches) of father (X) and their sons (Y) : 10

X	Y
65	67
66	68
67	65
67	68
68	72
69	72
70	69
72	71

10. The joint probability distributions of X and Y is given below : 10

X \ Y	–1	+1
0	1/8	3/8
1	2/8	2/8

Find the correlation coefficient between X and Y.