

Total No. of Questions : 10]
(1108)

[Total No. of Printed Pages : 7

**BCA UG (CBCS) RUSA Vth Semester
Examination**

4219

**COMPUTER ORIENTED STATISTICAL METHODS
BCA-0505**

Time : 3 Hours]

[Maximum Marks : 70

Note :- Part-A (both questions 1 and 2) is compulsory.
Attempt *four* questions from Parts B, C, D and E by
selecting *one* question from each Part. Marks are
indicated along the questions.

Part-A

Compulsory Question

1. Do as directed in the following questions. Choose
the appropriate answer.

- (i) The geometric mean of 1st 10 natural number is
8.8. (True/False)

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(ii) For usual meanings, the formula $G = (x_1 x_2 \dots x_n)^{1/n}$ stands for :

- (a) Median
- (b) Mean
- (c) Mode
- (d) Geometric mean

(iii) Coefficient of dispersion (C.D.) based upon

$$\text{range} = \frac{A_{\max} - B_{\min}}{A_{\max} + B_{\min}} \quad (\text{True/False})$$

(iv) Median is rigidly defined. (True/False)

(v) The probability that a non-leap year selected at random will contain 53 Mondays is :

- (a) $\frac{1}{7}$
- (b) $\frac{2}{7}$
- (c) $\frac{3}{7}$
- (d) None of these

(vi) The probability of doublets in a single throw of two dice is $\frac{1}{6}$. (True/False)

(vii) If X and Y are random variables, then $E(X + Y) = E(X) + E(Y)$, provided all the expectations exist. (True/False)

(viii) If X is a random variable, then $V(aX + b) = a^2 V(X)$, where a and b are constants. (True/False)

(ix) Correlation coefficient is independent of change of origin and scale. (True/False)

(x) $r_{XY} = 0 \Rightarrow X$ and Y are independent. (True/False)
10×1=10

2. Answer the following questions in 25 to 50 words.

- (i) Discuss merits and demerits of arithmetic mean.
- (ii) Explain measures of dispersion.
- (iii) State and prove the addition theorem of probability. (for two events)
- (iv) Discuss the variance of a linear combinations of n random variables.
- (v) Discuss Karl Pearson's coefficient of correlation.

5×4=20

Part-B

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

Class Interval	Frequency
0-8	8
8-16	7
16-24	16
24-32	24
32-40	15
40-48	7

- (b) Find the median wage of the following distribution :

Wages (In Rs.)	No. of Workers
2,000-3,000	3
3,000-4,000	5
4,000-5,000	20
5,000-6,000	10
6,000-7,000	5

$$2 \times 5 = 10$$

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(4)

4. The first of the two samples has 100 items with mean 15 and standard deviation 3. If the whole group has 250 items with mean 15.6 and standard deviation $\sqrt{13.44}$, find the standard deviation of the second group.

10

Part-C

5. (a) Twenty five boots are placed at random in a shelf. Find the probability that a particular pair of boots shall be always together.
- (b) Two dice are tossed. Find the probability of getting 'an even number on the first die or a total of 8'. $2 \times 5 = 10$
6. (a) A bag contains 17 counters marked with the numbers 1 to 17. A counter is drawn and replaced; a second drawing is then made. What is probability that the first number drawn is even and the second odd ?
- (b) A box contains 6 red, 4 white and 5 black balls. A person draws 4 balls from the box at random. Find the probability that among the balls drawn there is at least one ball of each colour. $2 \times 5 = 10$

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Turn Over

Part-D

7. (a) Find the expectation of the number on a die when thrown.
- (b) A box contains 'a' white and 'b' black balls. 'c' balls are drawn at random. Find the expected value of the number of white balls drawn. $2 \times 5 = 10$
8. A man with 'n' keys wants to open his door and tries the keys independently at random. Find the mean and variance of the number of trials required to open the door, (i) if unsuccessful keys are not eliminated from further selection, and (ii) if they are. 10

Part-E

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

X	1	3	4	5	7	8	10
Y	2	6	8	10	14	16	20

10

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(6)

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

X \ Y	-1	+1
0	$\frac{1}{8}$	$\frac{3}{8}$
1	$\frac{2}{8}$	$\frac{2}{8}$

Find the correlation coefficient between X and Y. 10

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