

Computer Oriented Statistical Methods

Paper-BCA -123

Time : Three Hours]

[Maximum Marks : 90

Note :- Attempt five questions, selecting at least one from each unit and question 1 is compulsory. All questions carry equal marks.

1. 'Short answer type questions:

(a) Find the range of the set

$$A = \{1, 2, 6, 7, 3, 10, 15, 18, 5\} . \quad 2$$

(b) The first four moments μ_1, μ_2, μ_3 and μ_4 of the set $A = \{4, 7, 5, 9, 8, 3, 6\}$. 5

(c) Find the probability of tossing a fair coin six times, there will be

(i) 0 Heads.

(ii) 2 or more Heads. 3

(d) If the regression co-efficients are 0.8 and 0.2 of a bivariate distribution, what would be the value of co-efficient of correlation ? 2

(e) Explain how poisson distribution is a special case of Binomial distribution ? 3

(f) If A and B are two events and P(A) is the probability of occurrence of A, then prove that $P(A \text{ and } B) = P(A) + P(B) - P(A \text{ or } B)$. 3

UNIT-I

2. Using the frequency table

Heights	60-62	63-65	66-68	69-71	72-74
Frequencies	5	18	42	27	8

Prove the relation

$$\text{Mean} - \text{Mode} = 3 (\text{Mean} - \text{Median})$$

18

3. (a) Write an algorithm to find Harmonic Mean (HM) of a set of N numbers $X_1, X_2, X_3, \dots, X_n$.
- (b) Show that mean deviation of a set of N numbers $X_1, X_2, X_3, \dots, X_n$ from arithmetic mean (\bar{X}) is always equal to zero.

9,9

UNIT-II

4. (a) By method of least square, find regression co-efficients b_{YX} (regression of X on Y) and b_{XY} for the following data:

X	1	2	3	4	5
Y	14	27	40	55	68

- (b) Find (a) arithmetic mean (b) standard deviation for a binomial distribution in which probability of success (p) = 0.7 and $N = 60$. 9,9
5. (a) Prove that the co-efficient of co-relation does not depend on change of scale and shift of origin.
i.e., $r_{xy} = r_{x'y'}$.
- (b) If 3% of electric bulbs manufactured by a company are defective, find the probability that a sample of 100 bulbs contain.
- (i) 0 (ii) 1
- (iii) 2 (iv) 5 bulbs are defective ? 9,9

UNIT-III

6. Explain :
- (a) Chi-square test for goodness of fit.
- (b) Confidence intervals.
- (c) Aim and advantages of regression analysis. 7,4,7
7. (a) Fit a least square parabola $Y = a + a_1X + a_2X^2$ to the data

X :	0	1	2	3	4	5	6
Y :	2.4	2.1	3.2	5.6	9.3	14.6	21.9

(b) Write algorithm to find $\sum_{i=1}^n X_i$, $\sum_{i=1}^n Y_i$ and $\sum_{i=1}^n X_i Y_i$ for a bivariate distribution :

X	X_1	X_2	X_3	X_N	
Y	Y_1	Y_2	Y_3	Y_N	9,9

UNIT-IV

8. (a) State and prove Baye's theorem in decision making ?
- (b) Describe Average percentage for casting method for long range forecasting and short range forecasting. 9,9
9. What is one way classification for analysis of variance ? By arranging results of any factor experiment, find total variation and variation between treatments ? 18

