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BCA/M-21 1897

COMPUTER ORIENTED STATISTICAL METHODS

Paper–BCA-245

Time allowed : 3 Hours **Maximum Marks : 80**

Note : Attempt **five** questions in all, selecting **one** question from each unit. Question No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (i) The export of wheat are given below as :
29.7, 16.6, 2.3, 14.1, 36.6, 18.7, 3.5, 21.3 Find median. 3

(ii) Give formulas for Quartile deviation, range and standard deviation of a sample? 3

(iii) A card is drawn from a well shuffled pack of 52 playing cards. What is the probability of the card being a red card or an ace card. 3

(iv) Prove that shift of origin changes the value of regression co-efficient? 3

(v) Calculate variance of binomial distribution? 2

(vi) Differentiate business forecasting and projection? 2

UNIT-I

2. Find arithmetic mean, mode and median for the following data as : 16

Weight	90-100	100-110	110-120	120-130	130-140	140-150	150-160	160-170	170-180
No. of Students	4	2	18	22	21	19	10	3	2

3. (i) For the following distribution : 8

(X_i)	4	8	12	16	20	24	28
(F_i)	2	4	5	6	4	2	2

Calculate first four moments μ_1, μ_2, μ_3, μ_4 about arithmetic mean $(\bar{X})$?

(ii) Prove that : 8

Harmonic Mean (HM) ≤ Geometric Mean (GM) ≤ Arithmetic Mean (AM).

UNIT-II

4. (i) Let A and B be two events with their probability P(A) and P(B) then prove that : 8

$$P(A/B) = \frac{P(A)}{P(B)} P(B/A).$$

(ii) Fit a Poisson distribution for the following data : 8

(X_i)	0	1	2	3	4
(F_i)	122	60	15	2	1

5. (i) In the estimation of regression equation of two variables x and y, the following results were obtained :

$\overline{X} = 90$, $\overline{Y} = 70$, $N = 10$, $\Sigma x_i^2 = 6300$, $\Sigma y_i^2 = 2860$ and $\Sigma x_i y_i = 3900$.

Find two regression equations. 8

(ii) The following are the marks obtained 8 students in English and History subjects, Compute rank correlation co-efficient. 8

English	15	20	28	12	40	60	20	80
History	40	30	50	32	20	10	30	60

UNIT-III

6. (i) Find Karl Pearson co-relation co-efficient of a group of 6 persons : 8

I.O.	110	100	140	120	80	90
Mark Obtained	70	90	80	60	10	20

(ii) For n pairs of values of x and y, the following results were found

$r_{xy} = 0.5$, $\sigma_y = 8$, $\Sigma u_i^2 = 90$, $\Sigma u_1 v_1 = 120$.

where $u_i = x_i - \overline{X}$ and $v_i = y_i - \overline{Y}$.

Find n, σ_x and two regression co-efficient. 8

7. (i) Fit a straight line for the following data : 8

x_i	2	3	4	5	6
y_i	900	600	200	110	50

(ii) A bag contains 4 red and 6 black balls and B contains 6 red and 4 black balls. A bag is chosen at random and a ball is drawn from it. The

colour of the ball drawn is black. What is the probability that the ball has been drawn from bag A. 8

UNIT-IV

8. (i) Define student t-test for test of equality of two population means. Also write assumptions of t-test? 8

   (ii) A sample of eleven (11) plants give the following shoot lengths as : Lengths (in mm) : 10.1, 21.5, 11.7, 12.9, 14.8, 11.0, 19.2, 11.4, 22.8, 10.8, 10.2 and an earlier study reported that the mean shoot length is 15 cm. Test whether the experimental data confirm the old view of 5% level of significance (t table value at 5% level of significance for 10 degree of freedom is 2.228). 8

9. Explain the following :

   (i) One way classification (ANOVA) 8

   (ii) Sampling errors and Non-sampling errors. 8