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BCA / M-19

COMPUTER ORIENTED STATISTICAL METHODS

Paper–BCA-245

Time allowed : 3 hours] *[Maximum marks : 80*

Note :- *A Candidate will be required to answer **five** questions in all, selecting **one** question from each unit in addition to compulsory Question No. 1. All questions will carry equal marks. **Question No. 1 is compulsory.***

Unit–I

1. (i) Define array and frequency. Give one example of each. 4
   (ii) Merits and Demerits of Karl Pearson's coefficient of correlation method. 4
   (iii) Applications of Chi–square distribution. 4
   (iv) State and prove Baye's theorem on Probability. 4

Unit–I

2. (a) Convert the following frequency table in to (i) less than form (ii) more than form. 8

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of Students	3	9	15	30	18	5

   (b) Define Harmonic mean for Individual series and frequency distribution and if the Harmonic mean of 100 students (observations) is found to be 17. Later on it was discovered that one item 20 was misread as 28. Find the correct value of the H.M. 8

3. (a) Calculate the M.D. about mean and median and its coefficient for the following distribution. 8

Marks	0-10	10-20	20-30	30-40	40-50
No. of Students	5	8	15	16	6

(b) Find the four central moments for the following. 8

X :	1	2	3	4	5	6	7	8	9
Y:	1	2	3	4	5	4	3	2	1

Unit–II

4. (a) From a lot of 10 items containing 3 defective items, a sample of 4 items is drawn at random. Let the random variable X denote the number of defective items in the sample. If the sample is drawn without replacement, find the mean and variance of X. 8

(b) A manufacturer of bulbs knows that 5% of his production is defective. If he sells bulbs in boxes of 100 and guarantees that not more than 4 bulbs will be defective, what is the approximate probability that a box will fail to meet the guaranteed quality? (given $e^{-5} = 0.0067$) 8

5. (a) Calculate Karl Pearson's Coeff of co-rrelation. 8

x	15	20	25	30	35	40
y	410	430	450	370	340	370

(b) Calculate coeff. of correlation by concurrent deviation method. 8

X	55	58	60	75	75	65	65	72
Y	30	25	35	45	45	52	46	50

Unit–III

6. (a) Find the line of regression of y on x. 8

x	10	9	8	7	6	4	3
y	8	12	7	10	8	9	6

(b) Calculate the standard error of the estimate of X from the regression of X on Y:- 8

$n = 10, \Sigma x^2 = 90, \Sigma xy = 120, \Sigma y^2 = 200$ where $x = X - \overline{X}$, $y = Y - \overline{Y}$. 8

7. (a) Fit a parabola $y = a + bx + cx^2$ for the data. 8

x	1	2	3	4	5	6	7	8	9
y	2	6	7	8	10	11	11	10	9

(b) Write a note on forecasting and types of forecasting. Explain briefly the methods of forecasting. 8

Unit–IV

8. (a) A random sample of 500 pineapples were taken from a large consignment and 65 were found rotten. Show that S.E. of the proportion of rotten ones in a sample of this size is 0.015 and deduce that 99.73% of rotten pineapples in the consignment certainly lie. between 8.5% and 17.5%.8

(b) Define students T–test and its important properties. What do you know about the estimation and types of estimation? 8

9. (a) In a locality 100 persons were randomly selected and asked about their educational qualifications. The results are given below: 8

	Educated	Non educated
Male	40	20
Female	25	15

Use Chi–square Test.

(Given: χ^2 at 5% level with 1 d.f. = 3.84)

(b) Three samples of sizes 5, 4 and 5 are drawn from samples A, B, and C respectively. Test hypothesis that the population means are equal or not at 5% level of significance by ANOVA table. 8

A	B	C
3	6	7
4	3	3
3	3	4
5	4	6
0	-	5