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BT–5 / D 12

STATISTICAL ANALYSIS

Paper–TT–309

Time allowed : 3 hours] *[Maximum marks : 100*

Note : *Attempt **five** questions in all, selecting at least **one** question from each unit.*

Unit–I

1. (a) Explain the term 'classification' and 'tabulation'. Point out their importance in a statistical investigation. What precautions would you take in tabulating statistical data ?

(b) The following distribution of weekly wages of 100 workers in a factory is given below :

Monthly wages (Rs.)	No.of workers	Monthly wages (Rs.)	No. of workers
3000–3500	3	5500–6000	10
3500–4000	5	6000–6500	8
4000–4500	12	6500–7000	5
4500–5000	23	7000–7500	3
5000–5500	31		

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Draw the histogram, frequency curve and also draw ogive curve for the distribution. Use ogive to determine the median wage of a worker.

2. (a) An incomplete distribution is given below :

Variable	:10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency:	12	30	?	65	?	25	18

You are told that the median value is 46. Using the median formula, fill up the missing frequencies and calculate the arithmetic mean of the complete table.

(b) What is sampling ? Distinguish between random sampling and stratified sampling.

(c) During an examination of equal length of cloth, the following number of defects are observed :

2, 3, 4, 0, 5, 6, 7, 4, 3, 2

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Draw a control chart for number of defects and comment on the conclusion.

Unit–II

3. (a) The following table gives the fluctuations in the prices of shares of two companies A and B. Find out which of them shows greater variability :

Share A :	318	322	325	312	324	315	308	319
Share B :	2542	2542	2534	2532	2545	2530	2566	2550

(b) Calculate the first four moments about the mean of the following distribution, also calculate β_1 and β_2.

x values in cm, are the mid-points of intervals :

x	:	2.0	2.5	3.0	3.5	4.0	4.5	5.0
f	:	5	38	65	92	70	40	0

4. (a) City Residents were surveyed recently to determine readership of newspapers available. 50% of the residents read the morning paper, 60%

read evening paper and 20% read both newspapers. Find the probability that a resident selected reads either the morning or evening paper or both the papers.

(b) In a bolt factory machines A, B, C manufactures respectively 25, 35 and 40 percent of the total. Out of their output 5, 4 and 2 percent are defective bolts. A bolt is drawn from the produce and is found defective. What are the probabilities that it was manufactured by A, B, and C ?

(c) A person draws 2 balls from a bag containing 3 white and 4 red balls. If he is to recieve 10 P for every white ball which he draws and 20 P for each red ball. Find his expectation.

Unit–III

5. (a) What is test of hypothesis ? Discuss various tests of hypothesis for the cases when the size of sample is large.

(b) Prices of shares (in Rs.) of a company on the different days in a month were found to be :

66, 65, 69, 70, 69, 71, 70, 63, 64 and 68

Test, whether the mean price of the shares in the month is 65.

6. (a) The number of automobile accidents per week in a certain city were as follows :

12, 8, 20, 2, 14, 10, 15, 6, 9, 4.

Are these frequencies in agreement with the belief that accident condition were the same during this 10 week period.

(b) A random sample of size 4 is taken from each of three independent normal random variables, X_1, X_2, X_3 resulting in the following table of sample values

X_1	13	11	16	22
X_2	16	8	21	11
X_3	15	12	25	10

Assuming that the three random variables

have equal variances, test at the 0.01 and 0.05 significance level, the hypothesis that the three distributions have the same mean.

Unit–IV

7. (a) Consider the following data, were x denotes the average daily temperature in degrees Faharenheit and y denotes the corresponding daily natural gas consumption in cubic feet.

x°F	50	45	40	38	32	40	55
y, ft^3	2.5	5.0	6.2	7.4	8.3	4.7	1.8

Find correlation coefficient r and comment on it.

(b) Given $x = 4y + 5$ and $y = kx + 4$ are the regression lines of x and y and y on x respectively. Show that $0 < 4k < 1$. If $k = \frac{1}{16}$, find the means of two variables and the coefficient of correlation between them.

8. (a) Find % rank correlation coefficient for the data given below :

Students :	1	2	3	4	5	6	7	8	9	10	11	12
Marks in Exam A :	15	13	17	14	18	12	20	16	18	17	19	21
Marks in Exam B :	18	16	18	15	19	16	18	15	21	17	18	20

(b) Describe the factorial Experiment as used in the completely Randomized Design.