

COMPUTER ORIENTED STATISTICAL TECHNIQUE

[Time: 2 $\frac{1}{2}$ Hours]

[Marks: 75]

NOTE:

- > All questions are compulsory.
- > Figures to the right indicate marks.
- > Use of calculator is allowed.



Q.1. Attempt any **THREE** from the following:

[5x3=15]

- a) Explain average.
b) Calculate the mode for the following data:

Class interval	2-4	4-6	6-8	8-10	10-12	12-14	14-16
frequency	3	2	4	1	5	6	2

- c) Find the first and second quartiles for the following data:

Income in Rs.'000	0-5	5-10	10-15	15-20	20-25	25-30
No. of person	1	5	3	8	2	4

- d) The standard deviation of a set of 50 items is 6.5. Find the standard deviation if every item is increased by 5.
e) Determine the mean deviation from mode of following:

Size	5-10	10-15	15-20	20-25	25-30	30-35
No. of items	15	10	11	8	9	4

- f) The sum of 50 observations is 500 and the sum of their squares is 6000. Compute coefficient of variation.

Q.2. Attempt any **THREE** from the following:

[5x3=15]

- a. Explain types of moments.
b. Find first three central moments about mean for the following frequency distribution:

X	2	4	6	8	10
f	1	3	5	8	4

- c. Two cards are drawn at random from a pack of 52 cards. What is the probability that (a) a king and queen (b) both are number card or face cards?
d. A box contains 18 bulbs of which 4 are defective. If 4 bulbs are drawn from the box at random, find the expected number of defective bulbs drawn.
e. Find expected mean and variance of following distribution:

X	1	2	3	4	5	6
P(X=x)	0.05	0.15	0.2	0.1	0.3	0.2

- f. The mean of a distribution is 5 and its first four central moments are 0, 3, 0 and 26. Find the corresponding moments about 4 and zero.

Q.3. Attempt any THREE from the following;

[5X3=15]

- Explain point estimation.
- Out of 1500 students from a college, 150 are defaulters. Estimate the percentage of defaulters in the college and also estimate standard error of estimate.
- A survey of 40 retired women revealed the mean age at which their income was maximum to be 45 years with a standard deviation of 6.3 years. Find 95% confidence limits for age of maximum earnings of women who survive till they retire.
- What is hypothesis? Also explain it's types.
- A certain coin is showed up head 270 occasions in 500 tosses. Test the claim that the coin is unbiased.
- In a sample of 500 parts manufactured by a company the number of defective part was found to be 40. The company however claimed that only 6% of their product is defective. Test at 5% level of significance whether the claim of the company is tenable.

Q.4. Attempt any THREE from the following:

[5X3=15]

- What is sampling distribution?
- The amount poured by an automatic machine on an average is 180 ml of milk with a s.d. 2 ml. find the probability that the average volume of milk filled in 100 cans from a lot is at most 180.2 ml.
- A large consignment of bats is assumed have 20% substandard bat. A sample of bats is selected from it. Find the probability that percentage of substandard bats in the sample is at most 16%.
- If x is a chi-square variate with 17 degree freedom. Find x_0, x_1 and α . (i) $p(x > x_0) = 0.01$
(ii) $p(x \leq x_1) = 0.95$ and $(x \leq 8.67) = \alpha$.
- The four identical coins tossed 100 times and the following results are obtained:

No. of tails	0	1	2	3	4
frequency	8	29	40	19	4

Are there sufficient evidences to conclude that are biased at 5% LOS?

- Fit a poisson distribution to the following data and test the goodness of fit.

X	0	1	2	3	4	5
frequency	20	34	27	15	3	1

Q.5. Attempt any THREE from the following:

[5X3=15]

- Explain least square lines.
- Find the regression line of equation of y on x for the following:

X	4	8	2	6	7
Y	6	8	2	3	8

- Fit a second degree curve for y on x to the following:

X	0	1	2	3	4	5
y	2.4	2.1	3.2	5.6	9.3	14.6

- Fit a straight line for the given export:

Year	1998	1999	2000	2001	2002	2003
Exports	14.3	14.2	14.4	14.1	13.9	14.1

- Explain the fitting of second degree curve using least square method.
- Calculate the coefficient of correlation between X and Y:

X	2	8	4	6	10	12	9
Y	1	10	6	9	13	20	9
