

COMPUTER ORIENTED STATISTICAL TECHNIQUES

QUESTION BANK

ADVANCED LEARNER

- 1) A dietician prescribed a certain diet to observe patients and noted the reduction in their weight after 6 months. The following data were obtained. Find the standard deviation

Reduction in weight in gms	0-400	400-800	800-1200	1200-1600	1600-2000
No. of patients	5	5	20	15	5

- 2) The following data refer to the milk contents of a sample of bags filled in by a certain can-filling machine

Milk contents (in ml.)	485-490	490-495	495-500	500-505	505-510
No. of bags	7	23	35	25	10

Find the coefficient of variation for the milk contents.

- 3) In a frequency distribution the co-efficient of skewness based upon the quartiles is 0.6. If the sum of the upper and lower quartiles is 100 and median is 38, find the value of the upper and the lower quartiles.
- 4) Five hundred ball bearings have a mean weight of 5.02 grams (g) and a standard deviation of 0.30 g. Find the probability that a random sample of 100 ball bearings chosen from this group will have a combined weight of between 496 and 500 g.
- 5) Measurements of a sample of masses were determined to be 8.3, 10.6, 9.7, 8.8, 10.2 and 9.4 kilograms (kg) respectively. Determine unbiased and efficient estimates of
- The population mean
 - The population variance
- 6) Two groups, A and B, consist of 100 people each who have a disease. A serum is given to group A but not to group B (which is called the control); otherwise, the two groups are treated identically. It is found that in groups A and B, 75 and 65 people, respectively, recover from the disease. At significance levels of 0.10, test the hypothesis that the serum helps cure the disease.

7) A survey of 320 families with 5 children each revealed the following distribution

Boys	5	4	3	2	1	0
Girls	0	1	2	3	4	5
No. of families	14	56	110	88	40	12

Is this results consistent with the hypothesis that male and female births are equally probable?

8) In his experiment with peas, Gregor Mendel observed that 315 were round and yellow, 108 were round and green, 101 were wrinkled and yellow and 32 were wrinkled and green. According to his theory of heredity, the numbers should be in the proportions 9:3:3:1. Is there any evidence to doubt his theory at the 0.01 significance level.

9) Obtain the line of regression of y on x for the data given below:

X	1.53	1.78	2.60	2.95	3.42
y	33.50	36.30	40.00	45.80	53.50

10) Fit second degree curve $y = a + bx + cx^2$ to the following data

X	1.2	1.8	3.1	4.9	5.7	7.1	8.6	9.8
y	4.5	5.9	7.0	7.8	7.2	6.8	4.5	2.7

SLOW LEAREN

1) Find mean height from the following data regarding weights of workers from a factory

Weight (in kg)	50-55	55-60	60-65	65-70	70-75
No. of workers	5	9	13	10	3

2) The following is the distribution of annual rainfall (in inches) recorded at a certain place in India. Find 3rd quartile and 43rd percentile.

Rainfall(in inches)	20-25	25-30	30-35	35-40	40-45	45-50	50-55
No. of years	2	5	8	12	10	7	6

3) Calculate the first four moments about the mean for the following set of examination marks: 45, 32, 37, 46, 39, 36, 41, 48 & 36

4) It has been found that 2% of the tools produced by a certain machine are defective. What is the probability that in a shipment of 400 such tools 3% or more will prove defective?

- 5) The voltages of 50 batteries of the same type have a mean of 18.2 volts (V) and a standard deviation of 0.5 volts. Find
- The probable error of the mean
 - The 50% confidence limits
- 6) Explain type I and type II error and level of significance.
- 7) In 200 tosses of a coin, 115 heads and 85 tails were observed. Test the hypothesis that the coin is fair at 5% LOS
- 8) The standard deviation of the heights of 16 male students chosen at random in a school of 1000 male students is 2.40 inches. Find 95% & 99% confidence limits for standard deviation for all male students at the school.
- 9) It is given that variance of $x = 9$ and two regression equations are $8x - 10y + 66 = 0$ and $40x - 18y = 214$. Find
- Mean values of x and y
 - Correlation coefficient between x and y
 - Standard deviation of y .

10) Find $\sigma_x, \sigma_y, V(x), V(y)$ and $cov(x, y)$ for the following data

X	1	2	3	5	4	3
y	2	4	5	5	3	1

ASSIGNMENT QUESTION

- 1) The table given below shows a frequency distribution of grades in a final examination in college. Determine :
- The lowest grade scored by the top 25% of the class.
 - The highest grade scored by the lowest 20% of the class.

Grade	No. of students
90 – 100	9
80 – 89	32
70 – 79	43
60 – 69	21
50 – 59	11
40 – 49	3
30 - 39	1

- 2) Find the probability that in 120 tosses of a fair coin, less than 40% or more than 60% will be heads.
- 3) The breaking strength of cables produced by a manufacturer have a mean of 1800 pounds and a standard deviation of 100 pounds. By new techniques in the manufacturing process, It is claimed that braking strength can be increased. To test this claim, a sample of 50 cables is tested and it is found that the mean breaking strength is 1850 lb. Can we support the claim at the 0.01 significance level?

4) In 360 tosses of a pair of dice, 74 sevens and 24 elevens are observed. Using the 0.05 significance level, test the hypothesis that the dice is fair.

5) Calculate linear regression coefficients from the following data:

X	1	2	3	4	5	6	7	8
y	3	7	10	12	14	17	20	24

