

(Following Paper ID and Roll No. to be filled in your
Answer Books)

Paper ID : 154401

Roll No.

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B.Tech.

(SEM. IV) THEORY EXAMINATION, 2015-16

STATISTICAL TECHNIQUES (MATHEMATICS-III)

Time : 3 Hours

Max. Marks : 100

Section-A

Q.1 Attempt all parts. All parts carry equal marks.

(10×2=20)

- (a) Find the median of the following data.
20, 18, 22, 27, 25, 12, 15, 13
- (b) Define kurtosis for a distribution.
- (c) Find the variance of following data.
3, 4, 9, 11, 13, 6
- (d) Find the probability of having atleast one tail in 4 throw of a coin.
- (e) Find the probability of getting even number in a throw of a dice.

- (f). Find coefficient of correlation of the following data.

x	1	2	3	4	5
y	5	4	3	2	6

- (g) Write a short note on statistical quality control.
- (h) Define null and alternate hypothesis.
- (i) Two lines of regression are given by $x + 2y - 5 = 0$, and $2x + 3y - 8 = 0$, calculate the mean value of x and y .
- (j) Karl pearson's coefficient of skewness of a distribution is 0.32, its S.D. is 6.5 and mean is 29.6. Find the mode of the distribution.

2. **Note: Attempt any five parts. All parts carry equal marks.**
(5×10=50)

- (a) Find mode of the following distribution.

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	15	20	20	32	14	14	5

- (b) The first three moments of a distribution about the value 2 of a variable are 1.16 and -40. Find the mean, variance and third moment about mean for the distribution.
- (c) Assume that a factory has two machines. Past records shows that machine no. 1 produced 30% of the items of output and machine no. 2 produced 70% of items. Further 5% of items produced by machine no. 1 were

defective and only 1% produced by machine no. 2 were defective. If an item is drawn at random and found to be defective. What is the probability that the defective item produced by machine no. 1.

- (d) The mean and variance of a Binomial distribution are 4 and $\frac{4}{3}$ respectively. Find the probability of (i) more than two success, (ii) at least two success.
- (e) Find the probability that at most 5 defective fuses will be found in a box of 200 fuses. If experience shows that 2% of such fuses are defective.
- (f) During an inspection of equal length of cable, the following are the number of defects observed: 2, 3, 4, 0, 5, 6, 7, 4, 3, 2. Comment whether the process is under control or not.
- (g) Calculate the rank correlation coefficient for the following data

x	81	78	73	73	69	68	62	58
y	10	12	18	18	18	22	20	24

Section-C

Note: Attempt any two questions from this section. (2×15=30)

3. Find the two lines of regression and coefficient of correlation for the data given below.

$$n=18, \Sigma x=12, \Sigma y=18, \Sigma x^2=60, \Sigma y^2=96, \Sigma xy=48.$$

4. The I.Q. level and economic condition of home of 1000 students of an engineering college were noted as given in the table

I.Q. \ Economic condition	High	Low	Total
Rich	100	300	400
Poor	350	250	600
Total	450	550	1000

Find out whether there is any association between economic condition and I.Q. level of students.

(Given for one d.f. and 5% level of significance, the value of $\chi^2 = 3.84$)

5. Find the measure of kurtosis on the basis of moments for the following data

Marks	5-15	15-25	25-35	35-45	45-55
No. of student	1	3	5	7	4