

Unit III

No. of Printed Pages : 06

Roll No.

5. From the following data calculate ' r ' between X and Y applying :

- (i) The method of least squares;
- (ii) The method based on regression coefficients
- (iii) The product moment method of Karl Pearson and verify the obtained result of one method with that of another. **15**

X	1	2	3	4	5	6	7	8	9
Y	9	8	10	12	11	13	14	16	15

6. A car fleet owner has 5 cars which have been in the fleet for several different years. The manager wants to establish if there is a linear relationship between the age of car and the repairs in hundred of dollars for a given year. This way, he can predict the repair expenses for each year as the cars become older. The information for the repair costs he collected for last year on these cars is given below :

BB-89

M. Tech. EXAMINATION, Dec. 2017

(Second Semester)

(B. Scheme) (Re-appear Only)

MECHANICAL ENGINEERING

MEI-506-B

Statistics for Decision Making

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss various methods of collection and presentation of data. **8**
(b) Explain the different measures of central tendency and measures of variation and skewness. **7**
2. (a) Discuss some important characteristics and applications of binomial distribution. **8**
(b) In the manufacturing of washers, thickness is the quality parameter which is to be controlled. It has been found that mean thickness is 20 mm and standard deviation is 0.15 mm. All the washers exceeding thickness of 2.50 mm are rejected. What percentage can be expected to be discarded ? **7**

Unit II

3. (a) Discuss in brief sampling distribution and its role in inferential statistics.
(b) What is Hypothesis ? How is it helpful in statistical decision-making ?
(c) A factory produces items, each weighing 5 kg. with variance 4. Can a random sample of size 900 with mean weight 4.45 kg. be justified as having been taken from this factory ? Test at 0.27% level of significance.
4. (a) Explain the application of Chi-square test in decision-making. **8**
(b) A certain time factor in a manufacturing operation has standard deviation of 14 seconds. If a group of 12 workers show a standard deviation of 17 seconds, could we say that this difference in variability is significant on the ten per cent level ? **7**

2	12	10	14	11	12
3	14	13	13	10	11
4	12	12	14	12	14

8. Write short notes on the following :

- (a) Analysis of variance and co-variance 8
- (b) Multivariate analysis techniques.

Car	Age(t)	Repairs(Y)
1	1	4
2	3	6
3	3	7
4	5	7
5	6	9

The manager wants to predict the repair expenses for next year for the two cars that are 3 years old now.

Unit IV

7. The following data show the time taken in minutes by five pain relieving drugs A, B, C, D and E to cure the pain of 20 patients. Each drug was taken by four patients. Using level of significance as 0.05, test whether there is any difference in efficacy in the five pain relieving drugs : 15

Patient		Drugs			
No.	A	B	C	D	E
1	13	11	13	12	12