



Roll No.

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B.Tech. (EEE) / (EE) (Sem.-4)

**MATHEMATICS-III (PROBABILITY AND STATISTICS)**

Subject Code : BTAM-302-18 M.Code : 77610

Date of Examination : 2-07-22

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

1. Write briefly :

- a) The marks out of 50 of a certain class consisting of 15 students in a class test are given as : 18, 19, 25, 29, 24, 23, 32, 40, 19, 26, 22, 20, 18, 35, 21. Find the median score.
- b) Consider the set of data 2, 3, 7, 8,10. Find the third moment about the mean.
- c) A coin is tossed successively three times. Determine the probability of getting at most 2 heads.
- d) If the mean of a binomial distribution is 3 and variance is  $\frac{3}{2}$ . Find the probability of obtaining at least 4 success.
- e) What do you mean by Normal distribution?
- f) Discuss the two properties of Correlation.
- g) Discuss the demerits of Spearman's coefficient of correlation.
- h) Explain the term Critical range with example.
- i) Discuss any two applications of t – test.
- j) What is Chi square test?

SECTION-B

2. Find the measure of skewness and kurtosis on the basis of moments of the following distribution and draw your conclusion :

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

3.

For the following probability distribution :

X	8	12	16	20	24
P(X)	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{12}$

Find  
(i)  $E(X)$   
(ii)  $E(X^2)$   
(iii)  $E[X - E(X)]^2$ .

4. A die is thrown 10 times. If getting an even number is a success then what is the probability of getting at least six successes?
5. A product is 0.5% defective and is packed in cartoons of 100. What percentage contains not more than 3 defective?
6. Fit a straight line to the following data considering  $y$  as a dependent variable :

X	1	2	3	4	5
y	5	7	9	10	11

SECTION-C

7. Calculate the correlation coefficient from the following results :

$$n = 10, \sum X = 140, \sum Y = 150, \sum (X - 10)^2 = 180, \sum (Y - 15)^2 = 215 \text{ and } \sum (X - 10)(Y - 15) = 60 .$$

8. The number of students in a class is 100. The average marks scored by 64 boys is 66 with standard deviation 10 while the average marks scored by 36 girls is 70 with standard deviation 8. Test at 10% level of significance whether the girls perform better than boys.
9. Two samples of sodium vapour bulbs were tested for length of life and the following results were got :

	Size	Sample mean	Sample S.D.
Type I	8	1234 hours	36 hours
Type II	7	1036 hours	40 hours

Is the difference in the means significant to generalize that type I is superior to type II regarding length of life?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

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