

Roll No.

Total No. of Pages : 02

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B.Tech. (EEE) (Sem.-4)
MATHEMATICS-III (Probability & Statistics)

Subject Code : BTAM-302-18

M.Code : 77578

Date of Examination : 12-07-22

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. Answer the following in short :

- a) The mean of 10 numbers is 7 and mean of 15 other numbers is 12. Determine the mean of 25 numbers taken together.
- b) Consider the set of data 2, 3, 7, 8, 10. Find the third moment about the origin.
- c) A coin is tossed successively three times. Determine the probability of getting exactly 2 heads.
- d) Find the mean of binomial distribution $B\left(4, \frac{1}{3}\right)$.
- e) State the properties of Poisson's distribution.
- f) State any two methods of curve fitting.
- g) What do you mean by regression?
- h) Explain the term Null hypothesis with example.
- i) What is t - test?
- j) State any two assumptions of F - test.

SECTION-B

- The mean and S.D of a set of 25 figures are known to be 18 and 5.5 of these figures one whose value was 25 was found to be in accurate. If the actual figure is 15 what is the accurate mean and S.D?
- Find the probability distribution of the number of heads when three coins are tossed simultaneously.
- The probability of a man hitting a target is $\frac{1}{4}$. He fires 7 times. What is the probability of his hitting at least twice the target?

Also find that how many times must be fire so that probability of hitting the target atleast once is greater than $\frac{2}{3}$.

- A manufacturer intends that his electric bulbs have a life of 1000 hours. He tests a sample of 20 bulbs drawn at random from a batch and discovers that the mean life of the sample bulb is 990 hours with standard deviation of 22 hours. Does this signify that batch is not up to the mark?
- Fit a straight line to the following data :

x	1	2	3	4	6	8
y	2.4	3	3.6	4	5	6

SECTION-C

- Calculate the coefficient of correlation given $n = 15$, $\sum X = 150$, $\sum Y = 160$, $\sum (X - 8)^2 = 170$, $\sum (Y - 10)^2 = 210$ and $\sum (X - 8)(Y - 10) = 55$.
- Suppose that 100 tyres made by a certain manufacturer lasted on average 21,819 miles with a certain standard deviation of 1295 miles. Test the null hypothesis $\mu = 20000$ miles against the alternative hypothesis $\mu < 20000$ miles at 0.05 level of significance.
- Find the Probability that at the most 5 defective fuses will be found in a box of 200 fuses, if experience shows that 2 percent of such fuses are defective.

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.