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Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (Electrical & Electronics) (2018 Batch) (Sem.-4)**MATHEMATICS-III (PROBABILITY & STATISTICS)****Subject Code : BTAM-302-18****M.Code : 77610****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**Answer the following in short :**

- Q1 Define Kurtosis.
- Q2 Find the expected number of heads appear, when a coin is tossed twice.
- Q3 Write the mean and variance of poisson distribution.
- Q4 Write the formula for χ^2 test.
- Q5 If a random variable X follows Poisson distribution such that $P(X = 1) = P(X = 2)$, find the mean of distribution.
- Q6 Find the probability that 6 out of 10 persons will recover from fever if the probability of recovering from fever is independent and 0.70.
- Q7 A problem of mathematics is given to three students A, B and C whose chances of solving it are $\frac{1}{2}$, $\frac{2}{3}$ and $\frac{3}{4}$ respectively. Find the probability that problem will be solved, if all of them try independently.
- Q8 The mean life time of sample of 100 fluorescent light bulbs produced by a company is computed to be 1570 hours with a standard deviation of 120 hours. The company claims that the average life of the bulbs produced by it is 1600 hours. Obtain 95% confidence limits of the mean of the population.
- Q9 A random sample of 900 members has a mean 3.4 cms. Can it be regarded as a sample from a large population of mean 3.2 cms and S.D. 2.3 cms?
- Q10 Find the mean and variance of the density function $f(x) = ae^{-ax}$, $a > 0$.

SECTION-B

- Q11 If the chance that any one of the 10 telephone lines is busy at an instant is 0.2, what is the chance that 5 of the lines are busy? What is the probability that all the lines are busy?
- Q12 A sample of 20 items has mean 42 units and S.D. 5 units. Test the hypothesis that, it is a random sample from a normal population with mean 45 units.
- Q13 Two random samples are drawn from two normal populations are as follows :

Sample A :	17	27	18	25	27	29	13	17
Sample A :	16	16	20	27	26	25	21	

Test whether the samples are drawn from the same normal population.

- Q14 In a normal distribution, 7% of the items are under 35 and 89% are under 63. Find the mean and standard deviation of the distribution.
- Q15 Find the value of correlation coefficient between x and y using the following result obtained after performing 15 experiments.

$$\sum x = 100.4, \sum x^2 = 750, \sum xy = 2055, \sum y = 280, \sum y^2 = 5690.5$$

SECTION-C

- Q16 Obtain the two lines of regression from the following pairs of observations on X and Y : (1, 3), (2, 3), (3, 5), (4, 6), (5, 5), (6, 8), (7, 8), (12, 10). Hence predict the value of Y for $X = 3.5$.
- Q17 Four coins were tossed 200 times. The number of tosses showing 0, 1, 2, 3, 4 heads were found to be as under. Fit a binomial distribution to the data. Also, find the expected frequencies.

No. of heads :	0	1	2	3	4
No. of tosses :	15	35	90	40	20

- Q18 Determine the constants a and b by the least squares method such that $y = ax^b$ fits the following data :

x :	1	2	3	4	5
y :	0.5	2	4.5	8	12.5

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.