# 3016

## B.Tech. (CSE) 2nd Semester G-Scheme Examination, May-2019

## MATH-II (PROBABILITY & STATISTICS)

## Paper-BSC-MATH-104-G

*Time allowed : 3 hours]* *[Maximum marks : 75*

***Note :*** *Attempt **five** questions in all by selecting **one** from each unit. **Question No. 1 is compulsory.** All question carry equal marks.*

**1.** (a) Define Sigma space and Probability Measures

(b) Define Chebyshev's Inequality.

(c) X is a Poisson's Variate and it is found that

$P[X = 2] = \frac{2}{3} P[X = 1]$. Find $P[X=3]$.

(d) Explain characteristics of the Normal Distribution.

(e) Find the probability of number 4 turning up at least once in two tosses of a fair dice.

(f) Explain properties of continuous distribution function.

### Unit-I

**2.** Find the correlation coefficient between x and y from the data :

| x | 78 | 89 | 97 | 69 | 59 | 79 | 68 | 57 |
|---|---|---|---|---|---|---|---|---|
| y | 125 | 137 | 156 | 112 | 107 | 138 | 123 | 108 |







**3.** State and deduce moment generating function and also find the moment generating function of the distribution $f(x) = \frac{1}{c} e^{-x/c}, 0 \le x - \infty, c > 0$. Hence find mean and standard deviation.

### Unit-II

**4.** In a bolt factory there are four machines A, B, C and D, manufacturing 20%, 15%, 25% and 40% of the total output respectively. Of there output 5%, 4%, 3% and 2% in the same order are defective balls. A ball is chosen at random from the factory production and it is found defective. What was the probability that the bolt was manufactured by machine A or D.

**5.** State and prove distribution of Quotient of two random variable.

### Unit-III

**6.** (a) Given that the median is 46, find the missing frequencies for the following incomplete frequency distribution :

| Class | : | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | Total |
|---|---|---|---|---|---|---|---|---|---|
| f | : | 12 | 30 | – | 65 | – | 25 | 18 | 229 |

(b) Two fair dices are rolled. Find the probability of getting doubles (two dices showing the same numbers) or the sum of 7.

7. Fit a normal curve to the following data :

| Class | : | 1-3 | 3-5 | 5-7 | 7-9 | 9-11 |
|---|---|---|---|---|---|---|
| f | : | 1 | 4 | 6 | 4 | 1 |

Also obtain the expected normal frequency.

**Unit-IV**

8. (a) In a referendum submitted to the student body at a university, 850 men and 560 women voted. Out of these 500 men and 320 women voted yes. Does this indicate a significant difference of opinion between men and women on the matter at 1% level of significance.

(b) The yield of wheat in a random sample of 1000 farms in a certain area as a standard deviation of 192 kg. On this random sample of 1000 farms gives a standard deviation 224 kg. Are the standard deviation significant different ?

9. Obtain the equation of the normal curve that may be fitted to the data given below and test goodness of-fit :

| x | : | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| y | : | 1 | 7 | 15 | 22 | 35 | 43 | 38 | 20 | 13 | 5 | 1 |