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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

   $P[X = 2] = \dfrac{2}{3} \; P[X = 1]$. 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

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

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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