MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

II B.Tech I Sem Regular End Examination, March 2021
PROBABILITY AND STATISTICS
(CIVIL)

Time: 3 Hours.   Max. Marks: 70

Note: 1. Answer any FIVE questions.
2. Each question carries 14 marks and may have a, b as sub questions.

1	a)	When two dice are thrown obtain the probability of getting an even number on the first die or a total of 8.	7M	CO-1	BL
	b)	In a certain college 25% of boys and 10%of girls are studying in mathematics. The girls constitute 60% of the students. If a student is selected at random and is found studying mathematics, find the probability that the student is (i) a girl (ii) a boy.	7M	CO-1	BL

2 a) Three urns A,B,C contains white, red and green balls as given below   7M   CO-1   BL

	Urn A	Urn B	Urn C
White	1	2	4
Red	2	1	5
Green	3	1	3

Two balls are drawn from an urn chosen at random. These are found to be one white and one green. Find the probability that the balls drawn are from urn C.

b) Obtain the moment generating function of the random variable X   7M   CO-1   BL
having the probability density function

$$f(x) = \begin{cases} x, & 0 \leq x \leq 1 \\ 2-x, & 1 \leq x \leq 2 \\ 0, & otherwise \end{cases}$$

3 a) The probability that a man hit a target is 1/3. If he fires 6 times find   7M   CO-1   BL
the probability that he fires (i) At most 5 times (ii) exactly two times
(iii) at least two times

b) Suppose 2% of the people on the average are left-handed. Find (i)   7M   CO-1   BL
the probability of finding 3 or more are left-handed (ii) the
probability of finding none or one are left-handed.

4 a) Is $f(x) = \frac{1}{2}x^2 e^{-x}$ when x≥0 can be regarded as a probability   7M   CO-2   BL

function for a continuous random variable? If, so find Mean and
Variance of the random variable.

b) In a Normal distribution, 7% of items are under 35 and 89% are   7M   CO-2   BL
under 63. Determine the mean and variance of the Distribution.

5 a) The density function of a random variable X is f(x) = $\begin{cases} e^{-x}, x \geq 0 \\ 0, \text{otherwise.} \end{cases}$ **7M CO-1 BL**

Find E(X), E(X²), Var(X).

b) Find the mean and variance of the Gamma distribution. **7M CO-2 BL**

6 a) The regression lines of two variables X and Y are **7M CO-2 BL**
$3X + 2Y - 26 = 0$ and $6X + Y - 31 = 0$ then find (i) the means of X and Y (ii) The regression coefficients (iii) the coefficient of correlation between X and Y.

b) Find the coefficient of correlation for the following data. **7M CO-2 BL**

Height of father(inches)	65	66	67	67	68	69	71	73
Height of son(inches)	67	68	64	68	72	70	69	70

7 a) Using the method of least squares, fit a parabola $y = ax^2 + bx + c$ to **7M CO-2 BL**
the following data

X	20	40	60	80	100	120
y	5.5	9.1	14.9	22.8	33.3	46.0

b) The time taken by workers in performing a job by method-I and **7M CO-3 BL**
method –II is given below

Method-I	20	16	26	27	23	22	-
Method-II	27	33	42	35	32	34	38

Do the data show that the variances of the time distribution from population from which the samples are drawn do not differ significantly?

8 a) In a survey of buying habits 800 men shoppers are chosen at **7M CO-3 BL**
random in a super market A located in a certain section of Mumbai city. Their average monthly food expenditure is Rs.500 with a SD of Rs.80. For another 800 men shoppers chosen at random in supermarket B of another section of the city, the average monthly food expenditure Rs.440 with a S.D of Rs.110, Test at 1% level of significance whether the average food expenditure of the two population of shoppers from the samples were obtained are equal.

b) In a city A 20% of a random sample of 900 school boys had eye **7M CO-3 BL**
sight. In another city B 18.5% of a random sample of 1600 school boys had the same defect. Is the difference between the proportions significant?

---ooOoo---