QUESTION PAPER CODE- 52014

University Institute of Engineering & Technology

(Recognised Under Section 2(f) and 12B of UGC)

Kurukshetra University, Kurukshetra

Roll No. -

THEORY EXAMINATION – MAY 2019	
B.TECH -	SEMESTER - II

TIME – 3 Hrs.

M.M. - 75

PAPER - BS-134

SUBJECT- **Probability &Statistics**

Note: All questions in part A and Part B are compulsory. Attempt any four from part C selecting at least one from each unit

PART A (15 Marks)

Q.No.1 Answer the following questions $15\times1=15$

(i) If $P(A)=\frac{1}{4}$, $P(B)=\frac{1}{3}$ and $P(A\cup B)=\frac{1}{2}$, evaluate $P(A/B)$.

(ii) What is the probability that a leap year selected at random will contain 53 Sundays.

(iii) Define relation between mean,median and mode.

(iv) Calculate median from the following data

22, 16, 18,13,15,19,17,20,23

(v) Calculate Q_1 from the following data

21,15,40,30,26,45,50,54,60,65,70

(vi) What are the merits of Geometric mean

(vii) Find the range from the following data

Marks	10	20	30	40	50	60	70
No. of students	15	18	25	30	16	10	9

(viii) What are the demerits of mean deviation

(ix) A fair coin is tossed thrice. Find the probability of getting 'exactly two heads'

(x) Define Kurtosis.

(xi) Find correlation coefficient (r) when $b_{yx}=0.697$ and $b_{xy}=0.904$.

(xii) The mean of a binomial distribution is 20 and standard deviation is 4. Find n, p and q.

(xiii) Define small samples.

(xiv) Define CHI-SQUARE test.

(xv) A random variable X has the following probability function

x	0	1	2
P(x)	0	k	2k

Find the value of k

PART B (20 Marks)

Q.No.2A pair of dice is tossed twice. Find the probability of scoring 7 points

(i) once

(ii) at least once

(iii) twice **5**

Q.No.3 A variate X has the probability distribution

x	-3	6	9
$P(X = x)$	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

Find $E(X)$ and $E(X^2)$. Hence evaluate $E(2X+1)^2$ **5**

Q.No.4 Calculate the quartile deviation and coefficient of quartile deviation from the following data

Wages (Rs.)	10	20	30	40	50	60
No. of workers	2	8	20	35	42	20

5

Q.No. 5 Fit a straight line to the following data

X	0	1	2	3	4
Y	1	1.8	3.3	4.5	6.3

5

PART C (40 Marks)

UNIT-I

Q.No. 6: There are three bags: First contain 1 white, 2 red, 3 green balls; second contain 2 white, 3 red, 1 green balls; and third contain 3 white, 1 red, 2 green balls. Two balls are drawn from a bag chosen at random. These are found to be one white and one red. Find the probability that the balls so drawn came from the second bag. **10**

Q.No. 7: Define the following

(i) Random variable

(ii) DiscreteRandom variable

(iii) Probability density function

(iv) Expectation

(v) Probability mass function **10**

UNIT-II

Q.No. 8: X is a continuous random variable with probability density function given by

$$f(x) = kx \ (0 \le x < 2)$$
$$= 2k \ (2 \le x < 4)$$
$$= -kx + 6k \ (4 \le x < 6)$$

Find k and mean value of X.

10

Q.No. 9: The probability that a pen manufactured by a company will be defective is $\frac{1}{10}$. If 12 such pens are manufactured, find the probability that

(i) Exactly two will be defective
(ii) at least two will be defective
(iii) none will be defective **10**

Unit-III

Q.No. 10: Calculate mean, median and mode from the following data

Variable	Frequency
10-13	8
13-16	15
16-19	27
19-22	51
22-25	75
25-28	54
28-31	36
31-34	18
34-37	9
37-40	7

10

Q.No. 11 In a fancy dress competition, two judges accorded the following ranks to eight participants

Judge X:	8	7	6	3	2	1	5	4
Judge Y:	7	5	4	1	3	2	6	8

Calculate coefficient of rank correlation. **10**

Unit-IV

Q. No. 12 Fit a second degree curve to the following data

x:	1	2	3	4	5	6	7	8	9
y:	2	6	7	8	10	11	11	10	9

10

Q. No.13 Fit a Poisson distribution to the following data and test for its goodness of fit at level of significance 0.05 **10**

x	0	1	2	3	4
f	419	352	154	56	19