R18 Regulation *Subject code:2H3AE*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech III Semester Supplementary Examinations, June 2026

PROBABILITY & STATISTICS

(Common to CE, ME, CSE & IT)

Maximum Marks: 70 Date:09.06.2026 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Statistical tables are allowed

Part-A

All the following questions carry equal marks (10X2M=20 Marks)		Marks	CO	BTL
1	If $f(x) = \begin{cases} \frac{1}{2}(x+1) & -1 < x < 1 \\ 0 & \text{elsewhere} \end{cases}$ Find E(x)	2M	1	L1
2	If f(x) = k(2x + 3) in 0<x<2, then find k?	2M	1	L1
3	If X is a poisson variate such that p(x=0) = p(x=1) = K. Determine K	2M	2	L1
4	If X =B(n,p) then write the conditions under which X tends to a poisson distribution.	2M	2	L1
5	Test whether the equations 2x + 3y = 4, and x-y=5 represent valued regression lines.	2M	3	L1
6	Write the two Regression equations.	2M	3	L1
7	Write the test statistic of single mean in large samples.	2M	4	L1
8	Define type II error.	2M	4	L1
9	Find $F_{0.01}$ (24,19)	2M	5	L1
10	Define small sample.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	The probability density function of a variable 'x' is x: 0 1 2 3 4 5 6 P(x): K 3k 5k 7k 9k 11k 13k Find (i) 'k' (ii) p(x < 4) (iii) p(3 < x ≤ 6)	10M	1	L2
	OR			
12	Let 'X' denote the sum of the two numbers that appear when a pair of fair dice is tossed. Determine the (i) Distribution function (ii) Mean and (iii) Variance	10M	1	L2

13	It has been found that 2% of the tools produced by a certain machine are defective what is the probability that in a shipment of 400 such tools. (a) 3% of more (b) 2% or less will prove defective	10M	2	L2
	OR			
14	If mean = 70, standard deviation is 16. Assume x follows normal distribution Find (i) p $(38 \leq x \leq 46)$, (ii) p$(62 \leq x \leq 86)$	10M	2	L2
15	From the following data calculate the rank correlation coefficient after making adjustment for tied ranks.	10M	3	L2

X	48	33	40	9	16	16	65	24	16	57
y	13	13	24	6	15	64	20	9	16	19

	OR			
16	Fit a following of the curve $y = ae^{bx}$	10M	3	L2

X	2	3	4	5	6
Y	144	172.8	207.4	248.8	298.5

17	The means of two large sample of sizes 1000 and 2000 members are 67.5 inches and 68.0 inches respectively. Can the samples be regarded as drawn from the same population of S.D 2.5 inches.	10M	4	L2
	OR			
18	In two large populations, there are 30% and 25% respectively of fair-haired people are this difference likely to be hidden in samples of 1200 and 9000 respectively from the two population.	10M	4	L2
19	A random sample of 10 boys had the following I.Q's : 70,120,110,101,88,83,95,98,107,100. Do these data support the assumption of a population mean I.Q of 100.	10M	5	L2
	OR			
20	Scores obtained in a shooting competition by 10 soldiers before and after intensive training are given below.	10M	5	L2

Before	67	24	57	55	63	54	56	68	33	43
After	70	38	58	58	56	67	68	75	42	38

Test whether the intensive training is usefull at 0.05 level of significance.