Code No: R2022051 **R20** **SET - 1**

II B. Tech II Semester Supplementary Examinations, December- 2023

PROBABILITY AND STATISTICS

(Common to CSE, CST, CSE(AIML), CSE(AI), CSE(DS), CSE(AIDS), CSE(CS), CSE(IOTCSIBCT), CSE(CSBS), CSE(IOT), AIDS, CS, CSD & AIML)

Time: 3 hours **Max. Marks: 70**

Answer any **FIVE** Questions each Question from each unit
All Questions carry **Equal** Marks

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UNIT--I

1 a) Calculate the median of the following data [7M]

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No of students	12	18	27	20	17	6

b) For the distribution mean is 10, variance is 16 , $\gamma_1 = +1, \beta_2 = 4$ then obtain first four moments about origin. [7M]

Or

2 a) Write a short note on statistics and methods used for data science. [7M]

b) The first three moments of the distribution about the value 2 are 1, 16 and -40 respectively. Examine the skewness of the distribution. [7M]

UNIT--II

3 a) Fit the curve $y = a+bx+cx^2$ for the following data [7M]

x	0	1	2	3	4
y	1	0	3	10	21

b) Calculate the coefficient of correlation between U and V if $U = 3x + 4, V = 3x - y$ Given that $E(x) = 5, E(y) = 10, V(x) = 4, V(y) = 9$. [7M]

Or

4 a) Fit the curve $y = ae^{bx}$ for the following data [7M]

x	0	1	2	3
y	1.05	2.10	3.85	8.30

b) Find the regression line y on x from the sample of 200 observations given below. [7M]
$\sum x = 11.34, \sum y = 20.78 \sum xy = 22.13 \sum x^2 = 12.16 , \sum y^2 = 84.96$

UNIT--III

5 a) Two dice are thrown one is green and other is red. Let A be the event that the sum of the points on the faces is odd and B be the event of at least one ace then find the [7M]

$(i) P\left(\bar{B}/\bar{A}\right) (ii) P(A/B)$

b) If X is a normal variate with mean 30 and variance 25 then find the probabilities [7M]
(i) $X \geq 45$ (ii) $|X - 30| > 5$.

Or

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6 a) For the probability distribution x $f(x) = ksin\frac{1}{5}\pi x$ $0 \leq x \leq 5$ find mean of the distribution. [7M]

b) In a precision bombing attack there is a 50% chance that any one bomb will strike the target. Two direct hits are required to destroy the target completely. How many bombs must be dropped to given a 99% chance or better of completely destroying the target? [7M]

UNIT--IV

7 a) Write a short note Estimation theory. [7M]

b) A random sample of 50 is taken from a population with mean 30 and S.D 5. Construct 98% confidence interval for the population mean. [7M]

Or

8 Samples of size 2 are taken from the population S = {3,5,4,8} , without replacement find the following [14M]

i. The mean of the population
ii. The standard deviation of the population
iii. Mean of the sampling distribution of means
iv The standard deviation of the sampling distribution of means

UNIT--V

9 a) In a hospital 180 female and 320 male babies were born in a week. Do these figures conform the hypothesis that males and females are born in equal number at 5% level. [7M]

b) It is claimed that a random sample of 49 tyres has a mean life of 15200km.This sample was drawn from a population whose mean is 15150kms and a standard deviation of 1200km, test the significance at 0.05 level of significance. [7M]

Or

10 a) Two samples are given with the following data. Test the claim at 5% level for the difference between two sample means are significant. [7M]

S.No	Sample size	Sample Mean	S.D of sample
1	8	12	3
2	7	10	4

b) The average marks scored in P&S by 32 boys is 72 with S.D of 8. While that 36 girls are 70 with a S.D of 6. Does this indicate that the boys perform better than girls at 5% level? [7M]