[Apr-24]

GITAM (Deemed to be University)
[MATH2361]
GST/GSS/GSB/GSHS. Degree Examination

IV Semester

PROBABILITY AND STATISTICS

(Effective from the admitted batch 2021-22)

Time: 2 Hours **Max. Marks: 30**

Instructions: All parts of the unit must be answered in one place only.

Section-A

1. **Answer all Questions:** **(5×1=5)**

   a) What is the probability for a non-leap year to have 52 Mondays and 53 Sundays?

   b) If X is a random variable and $E(X) = 2$. Find the value of $E(2x + 4)$.

   c) Write the normal equations by the method of least squares to fit a straight line to the given data.

   d) Among 900 peoples in a state 90 are found to be chapatti eaters. Construct 99% confidence interval for the population.

   e) Write any two applications of $F -$ distribution.

Section-B

Answer the following: **(5×5=25)**

UNIT-I

2. Calculate the mean and mode of the following data:

Marks	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of students	6	5	8	15	7	6	3

OR

3. In a bolt factory machines A, B, C manufacture 20%,30% and 50% of the total of their output and 6%.3% and 2% are defective. A bolt is drawn at random and found to be defective. Find the probabilities that it is manufactured from (i) Machine A (ii) Machine B (iii) Machine C

UNIT-II

4. For the following probability distribution.

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

Find (i) E(X) (ii) $E(x^2)$ (iii) $E[(2X+1)^2]$.

OR

5. A continuous random variable X has the distribution function.

$$F(X) = \begin{cases} 0, if x \leq 1 \\ k(x-1)^5, if\ 1 \leq x \leq 4 \\ 1, if\ x > 4 \end{cases}$$

Determine, (i) f(x) (ii) k (iii) Mean.

UNIT-III

6. Find rank correlation coefficient for the following data.

x	68	64	75	50	64	80	75	40	55	64
y	62	58	68	45	81	60	68	48	50	70

OR

7. Find the means of X and Y from the regression equations X = 2Y+3, 4Y = X+6 and also find the correlation coefficient.

UNIT-IV

8. Write down the general procedure for testing of hypothesis.

OR

9. A sample of 500 items is taken from a population whose standard deviation is 20. The mean of the sample is 50. Test whether the sample has come from a population with mean 48.

UNIT-V

10. The heights of **10** males of a given locality are found to be **70, 67, 62, 68, 61, 68, 70, 64, 64, 66** inches. Is it reasonable to believe that the average height is greater than **64** inches? Test at **5%** significance level. (t table value is 1.833).

OR

11. A group of boys and girls were given an intelligence test. The mean score, S. Ps and numbers in each group are as follows:

	Boys	Girls
Mean	107	112
S.D	10	8
Sample size	16	14

Is the mean score of boy's significant different form that of girls at 5% level of significance? (t table value is 1.701).