[Nov - 24]

GITAM (Deemed to be University)

GST/GSS/GSB/GSHSS Degree Examination

V Semester

MATH2361 : PROBABILITY AND STATISTICS

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

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

Section - A

1. Answer all questions **(5x1=05)**

a. What is the relation between mean,median and mode?

b. What are the mean and SD of binomial distribution?

c. What is the relationship between the correlation coefficient and the regression coefficient?

d. Define the power of the test.

e. The following is the number of columns and rows of a contingency table. Determine the number of degrees of freedom that the chi-square will have 6 rows, 6 columns

Section - B

Answer the following **(5x5=25)**

UNIT - I

2. A die is loaded in such a manner that for $n = 1, 2, 3, 4, 5, 6$, the probability of the face marked up n, landing on top when the die is rolled is proportional to n. Then find the probability that 1) an even number will appear on the die 2) an odd number will appear on the die 3) a prime number will appear on the die.

OR

3. The chance that doctor A will diagnose a disease X correctly is 60%. The chance that a patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of the doctor A, who had disease X died. The chance that his disease was diagnosed correctly.

UNIT - II

4. A random variable X has the following distribution.

x	1	2	3	4	5	6
P(x)	1 / 36	3 / 36	5 / 36	7 / 36	9 / 36	11 / 36

Determine the (i) mean (ii) P(2<x<5).

OR

5. In a particular branch of a bank, it is noted that the duration/waiting time of the customers for being served by the teller is normally distributed with mean 5.5 minutes and standard deviation 0.6 minutes. Find the probability that a customer has to wait a) between 4.2 and 4.5 minutes, (b) for less than 5.2 minutes, and (c) more than 6.8 minutes

UNIT - III

6. The rank of 15 students in two subjects A and B are given below. The two numbers within brackets denote the ranks of a student in A and B subjects, respectively.
$(1, 10), (2, 7), (3, 2), (4, 6), (5, 4), (6, 8), (7, 3), (8, 1),$
$(9, 11), (10, 15), (11, 9), (12, 5), (13, 14), (14, 12), (15, 13).$
Find Spearman's rank correlation coefficient.

OR

7. Explain the sampling distribution for means with usual notations. Find the standard error of an estimated sample mean for sampling distribution for the mean of a normal population with the size of the sample is 900 and SD is 30

UNIT - IV

8. A random sample of 100 items taken from a large batch of articles contains 5 defective items. Find the 95% and 99% confidence limits for the proportion of defective items in the batch.

OR

9. A sample of 900 members has a mean 3.4 cms and s.d 2.61 cms. Is the sample drawn from a large population of mean 3.25 cms and s.d 2.61 cms? 5% level.

UNIT - V

10. Pizza delivery times of two cities are given below
City 1: Number of delivery times observed = 28, Variance = 38
City 2: Number of delivery times observed = 25, Variance = 83
Test if the delivery times of city 1 are lesser than city 2 at a 0.05 level.

OR

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

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

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