[Nov-23]

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

III Semester

PROBABILITY AND STATISTICS

(Effective for the admitted batch 2021-2022)

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

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

SECTION-A

1. **Answer all the questions.** **(5×1=5M)**

   a) Find the median of the following values: 9, 13, 5, 7, 1, 9, 2, 9, 11.

   b) Average number of accidents on any day on a national highway is 0.61. Determine the probability that the number of accidents are at most one.

   c) Write the normal equations of fitting of a parabola.

   d) Give the test statistic of student's t-test for difference of means of two samples.

   e) Write the main use of χ^2 – test.

SECTION-B

Answer the following: **(5×5=25M)**

UNIT-I

2. Find the median of the following data.

Marks	< 40	41-50	51-60	61-70	71-80	>80
No. of students	10	20	15	25	10	20

OR

3. A businessman goes to hotels X, Y, Z, 20%, 50%, 30% of the time respectively. It is known that 5%, 4%, 8% of the rooms in X, Y, Z hotels have faulty plumbings. What is the probability that business man's room having faulty plumbing is assigned to hotel Z.

UNIT-II

4. A random variable X has the following probability function

X	1	2	3	4	5	6	7	8
P(x)	K	2K	3K	4K	5K	6K	7K	8K

Find i) K and ii) $P(2 \leq X \leq 5)$

OR

5. In a normal distribution, 7% of the items are under 35 and 89% are under 63. Determine the mean and variance of the distribution. (From normal tables: z = 1.48 corresponding to 0.43 and z = 1.23 corresponding to 0.39)

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. Fit the curve $y = a + bx$ to the following data:

x	1	2	3	4	5
y	14	27	40	55	68

UNIT-IV

8. An ambulance service claims that it takes an average less than 10 minutes to reach its destination in emergency calls. A sample of 36 calls has a mean of 11 minutes and the variance is 16 minutes. Test the claim at 0.05 level of significance. (Z tab at 5% los is 1.645)

OR

9. In a sample of 1000 people in Karnataka 540 are rice eaters and the rest are wheat eaters. Can we assume that both rice and wheat are equally popular in this state at 1% level of significance. (Z tab at 1% los is 2.58)

UNIT-V

10. Two random samples gave the following results:

Sample	Size	Sample Mean	Sum of squares of deviations from the mean
1	10	15	90
2	12	14	108

Examine whether the two normal populations have the same variances (F table value is 2.90).

OR

11. On the basis of information given below about the treatment of 200 patients suffering from a disease, state whether the new treatment is comparatively superior to the conventional treatment.

	Favourable	Not favourable	Total
New	60	30	90
Conventional	40	70	110

At 5 % level of significance. (Chi square table value 3.841).