[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) Sates Baye's theorem.

   b) If the probability of the defective bolt is 0.2, find the mean for the distribution of 400 bolts.

   c) Define regression and write any two applications.

   d) Define Type-I and Type-II errors.

   e) Write any two applications of $\chi^2 -$ distribution.

Section-B

Answer the following: **(5×5=25)**

UNIT-I

2. Calculate the Mean and Stranded deviation for the following table giving the age distribution of 542 members:

Age (in years)	20-30	30-40	40-50	50-60	60-70	70-80	80-90
No. of Members	3	61	132	153	140	51	2

OR

3. The chances that doctor A will diagnose a disease X correctly is 60%. The chances 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 doctor A, who had disease X, died. What is the chance that his disease was diagnosed correctly?

UNIT-II

4. For the following probability distribution

x	2	3	5	9
P(x)	0.1	0.2	0.4	0.3

Find (i) Mean (ii) Variance

OR

5. If X is normally distributed with mean 12 and S.D. 4 then find the probability of the following (i) $X \geq 20$ (ii) $X \leq 20$ (iii) $0 \leq X \leq 12$.

UNIT-III

6. Find the means of X and Y and the correlation coefficient from the regression equations 2Y-X-50=0, 3Y =2 X+10.

OR

7. Fit a Straight-line curve for the following data:

x	0	5	10	15	20	25
y	12	15	17	22	24	30

UNIT-IV

8. In a sample of 1000 people in Maharashtra, 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?

OR

9. On the basis of their total scores, 200 candidates of a civil service examination are divided into two groups, the upper 30% and remaining 70%. Consider the first question of the examination. Among the first group, 40 had the correct answer, whereas among the second group, 80 had the correct answer. On the basis of these results, can one conclude that the first question is not good at discriminating ability of the type being examined here.

UNIT-V

10. Define F – distribution. Write down its properties & applications.

OR

11. 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)