[Nov-23]

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

PROBABLITY & 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 Questions:** **(5×1=5)**

a) Define Random experiment.

b) Average number of accidents on any day on a national highway is 1.8. Determine the probability that the number of accidents are atleast one.

c) Write the normal equations of a fitting of a Straight line.

d) Write test statistic of single mean for large samples.

e) If $\bar{x}$ = 17.85, μ = 18.5, s = 1.955 and n = 14 then find test statistic t.

Section-B

Answer the following: **(5×5=25)**

UNIT-I

2. 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.

OR

3. Calculate the mean and standard deviation for the following distribution.

Size of Item	6	7	8	9	10	11	12
Frequency	3	6	9	13	8	5	4

UNIT-II

4. A random variable X has the following probability function

X	0	1	2	3	4	5	6	7
P(x)	0	K	2K	2K	3K	K^2	$2K^2$	$7K^2+K$

i) Detremine K (ii) Evaluate $P(X \geq 6)$.

OR

5. If X is normally distributed with mean 1 and S.D. 2 then find
(i) $P(X \leq 3)$ (ii) $P(2 < X < 5)$ (iii) $P(-1 < X < 0.5)$
(Table values: (i) $F(z_1) = 0.8413$,
(ii) $F(z_1) = 0.9772$, $F(z_2) = 0.6915$,
(iii) $F(z_1) = 0.5987$, $F(z_2) = 0.8413$).

UNIT-III

6. Fit a parabola curve $y = a + bx + cx^2$ for the following data:

x	0	1	2	3	4
y	1	1.8	1.3	2.5	6.3

OR

7. Following are the ranks obtained by 10 students in two subjects statistics and mathematics. To what extent the knowledge of the students in two subjects is related.

stat	1	2	3	4	5	6	7	8	9	10
math	2	4	1	5	3	9	7	10	6	8

UNIT-IV

8. Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same at 5% level.

OR

9. An ambulance service claims that it takes on the 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 of 16 minutes. Test the claim at 0.05 level of significance. (Z tab at 5% los is 1.645)

UNIT-V

10. The average breaking strength of the steel rods is specified to be 18.5 thousand pounds. To test this a sample of 14 rods were tested. The mean and standard deviation obtained were 17.85 and 1.955 respectively. Is the result of the experiment significant.? (t table value is 2.16).

OR

11. Pumpkins were grown under two experimental conditions. Two random samples of 11 and 9 pumpkins, show the sample standard deviations of their weights as 0.8 and 0.5 respectively. Assuming that the weight distributions are normal, test hypothesis that the true variances are equal. (F tab value 3.29)