

[Apr-24]

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

IV Semester

PROBABILITY & 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) Define Population and Sample.
- b) Define random variable and what are the types of random variable.
- c) Find the means of X and Y from the regression equations
 $X = 2Y + 3$, $4Y = X + 6$.
- d) Define Null hypothesis and Alternative Hypothesis.
- e) Write any two applications of F – distribution.

Section-B

Answer the following: **(5×5=25)**

UNIT-I

- 2. Calculate the Mean and Standard 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 contents of urns I, II and III are as follows:

urn I: 1 white, 2 black and 3 red balls,

urn II: 2 white, 1 black and 1 red ball, and

urn III: 4 white, 5 black and 3 red balls.

One urn is chosen at random and two balls drawn from it. They happen to be white and red. What is the probability that they come from urns I, II or III?

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	$2K^2$	$7K^2+K$

Determine: (i) K (ii) Mean (iii) 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. Obtain the equations of two lines of regression for the following data. Also obtain the estimate of X for Y=70.

X:	65	66	67	67	68	69	70	72
Y:	67	68	65	68	72	72	69	71

OR

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

x	1	2	3	4	5	6	7	8
y	19	22	23	25	26	28	17	20

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. 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. Define t – distribution. Write down its properties & applications.

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
Mean	124	121
S.D	12	10
Sample size	18	14

Is the mean score of boy's significant different from that of girls?
(t table value is 1.960)

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