Enrolment No. /Seat No.: _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA – SEMESTER II- EXAMINATION –WINTER-2025

Subject Code: 629409 **Date: 20/11/2025**

Subject Name: Statistical Methods

Time:02:30 PM TO 05:00 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make Suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Use of simple calculators and non-programmable scientific calculators are permitted.**

Q.1 **(a)** What is statistics? Explain types of statistics in detail. **07**

(b) Following is the distribution of persons according to different income groups. Calculate arithmetic mean. **07**

Income	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of persons	6	8	10	12	7	4	3

Q.2 **(a)** A data set contains the following seven values. **07**

6, 2, 4, 9, 1, 3, 5.

a. Find mode
b. Find median
c. Find the range.
d. Find the mean absolute deviation.
e. Find the population variance.
f. Find the population standard deviation.
g. Find the interquartile range.

(b) In a manufacturing plant, machine A produces 10% of a certain product, machine B produces 40% of this product, and machine C produces 50% of this product. Five percent of machine A products are defective, 12% of machine B products are defective, and 8% of machine C products are defective. The company inspector has just sampled a product from this plant and has found it to be defective. **07**

Determine the revised probabilities that the sampled product was produced by machine A, machine B, or machine C.

OR

(b) Explain bayes' theorem in detail. **07**

Q.3 **(a)** Explain Poisson Probability Distributions in detail. **07**

(b) If a fair coin is tossed 10 times, find the probability of exactly seven tails **07**

OR

Q.3 **(a)** Explain mutually exclusive and exhaustive events with example. **07**

(b) Students of a class were given an aptitude test. Their marks were found to be normally distributed with mean 60 and standard deviation 5. What percentage of students scored? i) More than 60 marks (ii) Less than 56 marks (iii) Between 45 and 65 marks **07**

Q.4 **(a)** Determine the equation of the regression line for the following data, and compute the residuals. **07**

X	15	8	19	12	5
Y	47	36	56	44	21

(b) Calculate Correlation Coefficient r **07**

X	102	111	115	113	112	114	111	116	119	121	123
Y	100	112	113	116	117	118	119	122	122	125	130

OR

Q.4 **(a)** What is Hypothesis? Give the detail note on general process of testing of hypothesis. **07**

(b) Explain one-tailed test and two-tailed test. **07**

Q.5 **(a)** A random sample of size 70 is taken from a population that has a variance of 49. The sample mean is 90.4 What is the point estimate of μ? Construct a 94% confidence interval for μ. **07**

(b) The Independent Insurance Agents of America conducted a survey of insurance consumers and discovered that 48% of them always reread their insurance policies, 29% sometimes do, 16% rarely do, and 7% never do. Suppose a large insurance company invests considerable time and money in rewriting policies so that they will be more attractive and easy to read and understand. After using the new policies for a year, company managers want to determine whether rewriting the policies significantly changed the proportion of policyholders who always reread their insurance policy. They contact 380 of the company's insurance consumers who purchased a policy in the past year and ask them whether they always reread their insurance policies. 164 respond that they do. Use a 1% level of significance to test the hypothesis. **07**

OR

Q.5 **(a)** Explain Type-I and Type – II Errors in detail. **07**

(b) Explain different types of Sampling methods. **07**

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