

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA– SEMESTER -I - EXAMINATION- SUMMER-2023

Subject Code: 4519207**Date: 18/07/2023****Subject Name: Business Statistics****Time: 02:30 PM TO 05:30 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** Definitions / terms / explanations / short questions based on concepts of theory/practical **14**
- (a) State Empirical Rule for Normal Distributions.
 - (b) What is Type – I and Type – II error in Hypothesis Testing?
 - (c) State the Four assumptions of Linear Regression Model.
 - (d) Which test is the non-parametric version of One Way ANOVA?
 - (e) Which numbers are used in Box – Whisker Plot?
 - (f) What is the range of Karl Pearson’s Coefficient of Correlation?
 - (g) Which test you will use in a hypothesis to check whether skills of a set of employees have changed before and after imparting a training program?

- Q.2** (a) The following data represents the weekly income of workers in a factory. **07**

Income	No of workers
1800-1900	24
1900-2000	39
2000-2100	64
2100-2200	36
2200-2300	22

Calculate Mean, Median & Mode.

- (b) Describe characteristics of Binomial Distribution. **07**

OR

- (b) Explain the steps of Hypothesis Testing. **07**

- Q.3** (a) At a certain university, 4% of boys are over 6 feet tall and 1% of girls are over 6 feet tall. The total student population of boys to girls is divided in the ratio 3:2. If a student is selected at random and found to have a height of over six feet tall. **07**

a) What is the probability that the student is a girl?

b) What is the probability that the student is a boy?

- (b) A research firm is investigating the safety of a dangerous road intersection. Historical data (from past police records) indicates an average of 6 accidents per month at this particular intersection. The number of accidents is distributed according to Poisson distribution. The research firm wants to calculate the probability of exactly 0, 1, 2, 3 accidents in any month. (Given: $e^{-6} = 0.002479$) **07**

OR

- Q.3** (a) A large mall has designed a parking lot which has a capacity to park 10,000 cars on an average with a standard deviation of 2000 cars. Find **07**

- a) Probability that the number of cars parked is between 9000 and 11000.
- b) Probability that the number of cars parked is more than 12000.

- (b) For a Uniform Distribution, the values are distributed between 200 and 240. 07
- a) Determine the mean and Standard Deviation for this distribution.
 - b) Find the Probability of $(205 \leq X \leq 220)$

- Q.4** (a) An automobile company is bringing out a new model of a bike. In order to map its advertisement campaign, it wants to determine whether the model appeal depends on age group or not. So the firm took a random sample of 500 people from different age group and obtained the following result. 07

Persons who	Under 20	20-40	40-50	Above 50	Total
Liked the Bike	146	88	48	28	310
Disliked the Bike	54	42	32	62	190
Total	200	130	80	90	500

Test the Hypothesis whether liking for the bike is independent of the age group or not. (Take 5% level of significance)

- (b) Write a brief note on Multiple Regression. 07

OR

- Q.4** (a) A psychologist wanted to compare two methods A & B of teaching. He selected 11 pairs of students such that a pair of student has equal intelligence. In each pair one student was taught by method A and another by method B. Then examination was taken and marks obtained by the pairs are as shown below. 07

Pair	1	2	3	4	5	6	7	8	9	10	11
Method A	24	29	18	14	31	19	27	30	20	28	11
Method B	37	35	17	26	23	27	19	20	16	11	21

Find Spearman's Rank Coefficient between Method A & Method B.

- (b) Write brief note on Mann-Whitney U-Test. 07

Q.5 CASE STUDY:

Use the following data where x is independent & y is dependent variable

X	53	47	41	50	58	62	45	60
Y	5	5	7	4	10	12	3	11

- (a) Find the regression line equation of Y on X. 07
- (b) Find the Sum Square of Error. 07

OR

- Q.5** (a) Find the Correlation Coefficient between X & Y. 07
- (b) What will be the Coefficient of Determination? 07
