

# GUJARAT TECHNOLOGICAL UNIVERSITY

## MBA-SEMESTER-I-EXAMINATION-WINTER-2024

**Subject Code: 4519207****Date: 20/01/2025****Subject Name: Business Statistics****Time: 10:30 AM TO 01:30 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** Answer in short: **14**

Definitions / terms / explanations / short questions based on concepts of theory/practical

- (a) Give two examples each of Nominal and Ordinal Data to differentiate between them.
- (b) If  $\text{Mode} < \text{Median} < \text{Mean}$ , what type of skewness does it indicate?
- (c) Define Standard Normal Distribution.
- (d) What is Level of Significance?
- (e) What is Residual in regression analysis?
- (f) Name some bivariate non-parametric tests.
- (g) Which test is the non-parametric alternative to the One Way Analysis of Variance?

**Q.2** (a) Explain the difference between Variable and Data. Also explain briefly different types of variables like discrete, continuous, dependent, independent, intervening and extraneous with example. **07**

- (b) An assembly consists of two parts A & B. The manufacturing process of each part is such that the probability of defect in part A is 0.08 and that in part B is 0.05. What is the probability that the assembled product will not have any defect? **07**

**OR****(b)** The IQ scores of 120 students are as follows: **07**

IQ	No. of Students
60 - 70	5
70 - 80	8
80 - 90	10
90 - 100	18
100 - 110	25
110 - 120	21
120 - 130	19
130 - 140	10
140 - 150	4

Determine whether the data is skewed or not?

Also specify the type of skewness.

**Q.3** (a) Describe Characteristics of Binomial Distribution. **07**

- (b) A manufacturer of pins knows that an average of 5% of his production is defective. He sells pins in boxes of 100 and guarantees that not more than 4 pins will be defective. What is the probability that a box will meet the guaranteed quality? **07**

**OR**

- Q.3** (a) Explain the types of error in Hypothesis testing. **07**

- (b) A workshop produces 5000 units per day. The average weight of the units is 140 Kg with a standard deviation of 8 kg. The variable weight follows a normal distribution. Find the number of units weighing less than 145 kg. **07**

- Q.4** (a) Write a short note on Factor Analysis. **07**

- (b) Ashoka Restaurant in the city has been averaging sales of 300 lunch packets per day. Due to construction of new buildings in the nearby areas, Ashoka restaurant expects that there will be an increase in sales. During the first 16 days after the new buildings were occupied, the daily sales were :  
304, 367, 385, 386, 262, 329, 302, 292, 350, 320, 298, 258, 364, 294, 276 and 333 lunch packets.

On the basis of the above sample data of 16 days of sales, conclude whether the expectation of Ashoka Restaurant that the sales will increase is correct or not? Assume 5% level of significance.

**OR**

- Q.4** (a) Explain in short Kruskal – Wallis Test and its use. **07**

- (b) Is the transportation mode used to ship goods independent of the type of Industry? To study this question the contingency table mentioned below represents the frequency counts of types of transportation used by the Publishing and the Computer hardware industries. Analyse the data using Chi-square test for independence to determine whether type of industry is independent of the transportation mode. Take  $\alpha = 0.05$ .

Type of Industry	Transportation Mode		
	Air	Train	Truck
Publishing	32	12	41
Computer hardware	5	6	24

- Q.5** **CASE STUDY:**

A research firm has the following data related to 11 manufacturing units in textile industry.

X = Advertisement Expenses in lakh.

Y = Revenue in Lakh.

X	23	41	37	29	25	17	33	41	40	28	19
Y	201	259	234	240	231	209	229	246	248	227	200

- (a) Write down all the steps required to perform a Simple Regression Analysis of finding the regression line of Y on X. **07**

- (b) Using the steps above find the equation of the regression line of Y on X. **07**

**OR**

- Q.5** (a) Determine the co-efficient of correlation between X & Y and comment on it. **07**

- (b) Convert the X & Y data into ranks and calculate the rank co-efficient. **07**

\*\*\*\*\*