Seat No._____ **Enrollment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA-SEMESTER-I-EXAMINATION-SUMMER-2025

Subject Code: MB01092041 **Date: 05/06/2025**
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 of terms with explanations **14**

a) Type I and Type II Error
b) Skewness & Kurtosis
c) Mutually Exclusive Events
d) Data Measurement
e) List out Names of Parametric & Non-Parametric Test
f) Multivariate
g) Measures of Central Tendency

Q.2 (a) The Air Transportation Association publishes figures on the busiest airports in its country. The following frequency distribution has been constructed from recent year. **07**

No. of Passengers Arriving & Departing (in Millions)	No. of Airports
20 under 30	8
30 under 40	7
40 under 50	1
50 under 60	0
60 under 70	3
70 under 80	1

a) Calculate Mean of these data
b) Calculate Mode
c) Calculate the Variance & Standard Deviation

Q.2 (b) Define Business Statistics and explain Applications of Statistics in Business with examples. **07**

OR

Q.2 (b) A problem of business statistics is given to five students, P Q R S and T. Their chances of solving it are ½, ⅓ , ¼ , ⅕, and ⅙ respectively. What is the probability that the problem will be solved? and What is the probability that the problem will not be solved.? **07**

Q.3 (a) The lifetime of certain kinds of electronic devices have a mean of 300 hours and standard deviation of 25 hours. Assuming that the distribution of these lifetimes, which are measured to the nearest hour, can be **07**

approximated closely with a normal curve.

a) Find the probability that any one of these electronic devices will have a lifetime of more than 350 hours.
b) What percentage will have lifetimes of 300 hours or less.?
c) What percentage will have lifetimes from 220 or 260 hours.?

Q.3 (b) Define Hypothesis and explain in detail steps of hypothesis **07**

OR

Q.3 (a) To test the significance of variation in the retail prices of a commodity in three principal cities, Mumbai, Kolkata and Delhi, four shops were chosen at random in each city and the prices who lack confidence in their mathematical ability observed in rupees were as follows: **07**

Mumbai :	16	8	12	14
Kolkata :	14	10	10	6
Delhi :	4	10	8	8

"Apply F test for the given data"

Q.3 (b) Define Probability and explain Law of Addition and Multiplication using Venn Diagram **07**

Q.4 (a) Two hundred randomly selected adults were asked whether TV shows as a whole are primarily entertaining, educational, or a waste of time. The respondents were categorized by gender. Their responses are given in the following table: **07**

Opinion				
Gender	Entertaining	Educational	Waste of Time	Total
Female	52	28	30	110
Male	28	12	50	90
Total	80	40	80	200

Apply Chi Square test for suitable data

Q.4 (b) Properties of Binomial Distribution and Normal Distribution **07**

OR

Q.4 (a) In a random Sample of 1000 persons from UP 510 were found to be consumers of cigarettes. In another sample of 800 persons from Rajasthan, 480 were found to be consumers of cigarettes. Does the data reveal a significant difference between UP and Rajasthan so far as the proportion of consumers of cigarettes is concerned ? **07**

Q.4 (b) Differentiate Parametric and Non Parametric Tests **07**

Q. 5 The following data relate to advertising expenditure (in Lakh) and their corresponding sales (in Crore).

Advertising Expenditure	10	12	15	23	20
Sales	14	17	23	25	21

a) Calculate Simple Regression Line to fitting the data **07**
b) Calculate the Standard Error of estimate of sales on advertising expenditure **07**

OR

Q.5 (a) What is Correlation.? Explain its Various types using the Scatter Diagram Method. **07**

Q.5 (b) What are Regression Lines.? Explain with the help of examples its usefulness in business decision making. **07**

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Seat No. /Enrollment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA-SEMESTER-I-EXAMINATION-WINTER-2024

Subject Code: MB01092041 Date: 18/01/2025

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 Define the following Terms: **14**

(a) Additional rules for the two events if they are mutually exclusive

(b) Relationship between R & R2

(c) Ogive

(d) Empirical Rule

(e) Binomial Distribution

(f) Skewness

(g) Type I error and Type II error

Q.2 **(A)** Explain the types of Hypotheses. Difference between Null and Alternate Hypotheses, Explain with an Example. **07**

(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. Determine the revised probabilities that the sampled product was produced by machine A, machine B, or machine C. **07**

OR

(B) Is the transportation mode used to ship goods independent of type of industry? Suppose the following contingency table represents frequency counts of types of transportation used by the publishing and the computer hardware industries. Analyse the data to determine whether type of industry is independent of transportation mode. Let $\alpha = .05$. **07**

		Transportation Mode		
		Air	Train	Truck
Industry	Publishing	32	12	41
	Computer Hardware	5	6	24

Q.3 **(A)** Explain Random Variable associated with an Experiment. Differentiate the Discrete and Continuous Probability Distributions and explain the types of it. **07**

(B) A light-aircraft engine repair shop switched the payment method it used from hourly wage to hourly wage plus a bonus computed on the time required to disassemble, repair, and reassemble an engine. The following are data collected for 6 engines before the change and 6 after the change. Evaluate the dataset to test the significant difference at alpha =0.05 using appropriate non-parametric test. **07**

Hours required	
Before	**After**
1950	1760
1840	1870
2015	1810
1580	1660
1790	1340
1925	1765

OR

Q.3 **(A)** Explain four level of data measurements with suitable examples. **07**

(B) Hinton Press hypothesizes that the average life of its largest web press is 14,500 hours. They know that the standard deviation of press life is 2,100 hours. From a sample of 25 presses, the company finds a sample mean of 13,000 hours. At $\alpha = 0.01$ significance level, should the company conclude that the average life of the presses is less than the hypothesized 14,500 hours? **07**

Q.4 **(A)** Explain the Poisson distribution and its characteristics. **07**

(B) As the Finance Manager at Adani Industries, you have been tasked with analysing the relationship between the Sensex returns and the returns of Adani's stock price over the past year. The objective is to predict the stock's performance based on the movement of Sensex returns using regression analysis. Develop a regression model to evaluate and quantify the relationship between the Sensex and Adani stock returns. Use the regression equation to estimate Adani's return when Sensex return is 7%. **07**

Sensex Return	12	21	28	8	20
Adani return	17	15	22	19	24

OR

Q.4 **(A)** How does factor analysis differ from predictive analysis, particularly in terms of its purpose and approach? Illustrate your explanation with an example. **07**

(B) Tompkins Associates reports that the mean clear height for a Class A warehouse in the United States is 22 feet. Suppose clear heights are normally distributed and that the standard deviation is 4 feet. A Class A warehouse in the United States is randomly selected. **07**

(I) What is the probability that the clear height is greater than 17 feet?

(II) What is the probability that the clear height is less than 13 feet?

(III) What is the probability that the clear height is between 25 and 31 feet?

Q.5 The U.S. Department of the Interior releases figures on mineral production. Following are the 15 leading states in nonfuel mineral production in the United States.

State	**Values($ billions)**	**State**	**Values($ billions)**
Arizona	7.84	Georgia	2.08
California	6.48	Colorado	2.05
Nevada	4.20	Michigan	2.05
Florida	4.17	Pennsylvania	1.89
Utah	4.00	Alaska	1.85
Texas	3.30	Wyoming	1.81
Minnesota	3.21	Illinois	1.68
Missouri	2.74		

(A) Using appropriate tools illustrate about central tendency & dispersion of above dataset. **07**

(B) Discuss about skewness of dataset using appropriate statistical tool. **07**

OR

(A) Using appropriate tools, Illustrate Five-point summary chart **07**

(B) Discuss about outliers of dataset using appropriate statistical tool **07**

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