

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA – SEMESTER – 1 • EXAMINATION – SUMMER 2019

Subject Code: 810007

Date: 22/05/2019

Subject Name: Quantitative Analysis

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.

- Q.1** (a) Explain the concept of Central Tendency. Which are the key measures of central tendency? Explain advantages and disadvantages of each of the measures of central tendency. **07**
- (b) Define Type I and Type II error. Highlight the key differences between them. **07**
- Q.2** (a) The percentage of people (to the nearest 10) responding to an advertisement is a random variable denoted by X with the following distribution. **07**

X (%)	0	10	20	30	40	50
p(x)	0.1	0.2	0.35	0.2	0.1	0.05

- 1) What is the expected percentage of people responding to an advertisement?
- 2) What is the SD of percentage of people responding to an advertisement?
- 3) Find the probability that more than 20% will respond to the advertisement

- (b) What do you understand by Normal distribution? Enlist six characteristics of it **07**
- OR**
- (b) In a manufacturing plant, machine A produces 10% of a certain product, machine B produce 40% of this product and machine C produces 50% of this product. 5% of machine A products are defective, 12% of machine B products are defective and 8% of machine C products are defective. Determine the revised probabilities that the sampled product was produced by machine A, machine B and machine C. Apply your knowledge of Bayes theorem **07**

- Q.3** (a) Calculate Mean and Standard Deviation from the following table. **07**

Class	Frequency
18-24	17
24-30	22
30-36	26
36-42	35
42-48	33
48-54	30
54-60	32
60-66	21
66-72	15

- (b) Write a short note on level of data measurement **07**
- OR**

- Q.3 (a)** A company produces 16 personal computers knowing that 4 of them have defective wiring. The company that purchased the computers is going to test the 3 of the computers. The purchasing company can detect the defective wiring. Determine the probability that the purchasing company will find the following? **07**
 a. No defective computers b. exactly three defective computers

- (b)** What do you mean by Empirical Rule? How it is different from Chebyshev's Theorem? **07**

- Q.4 (a)** Use the following data to determine the equation of the least square regression line, also calculate R-square. **07**

X	5	7	3	16	12	9
Y	8	9	11	27	15	13

- (b)** Explain the importance of Expected Value & Expected Value of Perfect Information in business decision making. **07**

OR

- Q.4 (a)** Use the decision table given here to complete parts (1) to (4) **07**
 (1) Use the maximax criterion to determine which decision alternative to select.
 (2) Use the maximin criterion to determine which decision alternative to select.
 (3) Use the Hurwicz criterion to determine which decision alternative to select. Let $\alpha = 0.3$ and then let $\alpha = 0.8$ and compare the results.
 (4) Compute an opportunity loss table from the data. Use this table and a minimax regret criterion to determine which decision alternative to select

State of nature	S1	S2	S3	S4
Decision Alternatives				
D1	50	70	120	110
D2	80	20	75	100
D3	20	45	30	60
D4	100	85	-30	-20
D5	0	-10	65	80

- (b)** What are the different sampling techniques? Explain in detail. **07**

- Q.5 (a)** Calculate Laspeyre's and Passche's price index using the following data: **07**

Item	Price -2006	Quantity	Price-2007	Quantity
1	6.70	150	6.95	135
2	1.35	60	1.45	65
3	5.10	8	6.25	12
4	4.50	25	4.95	30
5	11.95	6	13.20	7
6	7.90	4	9.00	2

- (b)** The average commission charged by full-service brokerage firms on a sale of common stock is Rs. 144, and standard deviation is Rs. 52. Mr. Shah has taken a random sample of 121 trades by his clients and determined that they paid an average commission of Rs. 151. At a 0.10 significance level, can Mr. Shah conclude that his clients' commissions are higher than the industry average? **07**

OR

- Q.5 (a)** A consumer-research organization routinely selects several car models each year and evaluates their fuel efficiency. In this year's study of two similar subcompact models from two different automakers, the average gas mileage for 12 cars of brand A was 27.2 miles per gallon, and the standard deviation was 3.8 mpg. The nine brand B cars that were tested average 32.1 mpg, and the standard deviation was 4.3 mpg. At $\alpha = 0.01$, should it conclude that brand A cars have lower average gas mileage than do brand B cars? **07**

- (b)** Compute a one-way ANOVA on the following data. **07**

1	2	3	4
113	120	132	122
121	127	130	118
117	125	129	125
110	129	135	125

Determine the observed F value. Compare the observed F value with the critical table F value and decide whether to reject the null hypothesis. Use a 1% level of significance.
