

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA - SEMESTER- I EXAMINATION – WINTER 2019

Subject Code: 4519207

Date: 2-01-2020

Subject Name: Business Statistics

Time: 10:30 AM TO 1.30 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 Definitions / terms / explanations / short questions **14**

- a) Define Discrete and Continuous variable.
- b) Type I and Type II error.
- c) Explain law of addition of probability.
- d) What is a Null Hypothesis?
- e) List assumptions of simple linear regression.
- f) List some non-parametric tests.
- g) What is the objective of factor analysis?

Q.2 (a) What are non-parametric tests? Explain in short Mann-Whitney U Test. **07**

(b) Use the following contingency table to determine whether social class is independent of number of children in a family. Take $\alpha = 0.05$. **07**

		Social Class		
		Lower	Middle	Upper
No. of Children	0	7	18	6
	1	9	38	23
	2 or 3	34	97	58
	More than 3	47	31	30

OR

(b) Compute spearman's rank correlation for the following data. **07**

x	99	67	82	46	80	57	49	91
y	108	139	117	168	124	162	145	102

Give your comments on the coefficient.

Q.3 (a) Explain properties of Binomial Distribution. **07**

Q.3 (b) A Machine is set to fill in coffee powder in tins, with an average weight of 200 grams and standard deviation of 4 **07**

grams. Find the probability that a coffee tin selected at random shall contain

- At least 200 grams.
- Between 200 and 206 grams.
- Between 195 and 205 grams.
- Less than 196 grams.

OR

Q.3 (a) Explain steps of hypothesis testing. **07**

Q.3 (b) The probability that an individual suffers from a bad reaction from an injection of a given serum is 0.001. **07**

Determine the probability that out of 2000 individuals:

- Exactly 3 individual suffers a bad reaction.
- More than 2 suffers a bad reaction.
- Between 4 and 6 individual (both inclusive) suffers a bad reaction.

Q.4 (a) A physical fitness center claims that their training program results in “Weight Loss” for obese people. In order to test the claim, 8 persons who underwent the training program are randomly selected. The weights pre and post training program are given below: **07**

Person	1	2	3	4	5	6	7	8
Weight before	145	200	160	185	164	175	189	148
Weight after	143	190	165	183	160	176	176	140

What can be said about the claim at $\alpha = 5\%$

(b) The following data relate to prices and supplies of a commodity during a period of eight years. **07**

Price (Rs./kg)	10	12	18	16	15	19	18	17
Supply (kg)	30	35	45	44	42	48	47	46

Calculate the co-efficient of correlation between price and supply.

OR

Q.4 (a) A company manufactures different types of electrical appliances. It has been using radio for advertising its products. The following table shows the time of advertisement (X) in minutes and the number of electrical appliances sold (Y) over the last 7 weeks. **07**

X	25	18	32	21	35	28	30
Y	16	11	21	15	26	32	20

Find regression line of Y on X. and find the appliances sold for advertisement time of 27.

(b) The management of a company claims that the average weekly income of their workers is Rs. 1900. The trade union has dispute **07**

that is less than this figure. An independent survey of 150 randomly selected workers showed an average weekly income of Rs. 1850 with a standard deviation of Rs. 300.

Taking a level of significance of 5% would you accept the claim of management or the trade union?

Q.5

CASE STUDY:

14

A random sample of voters in a small village is classified by age group as shown below.

Age Group	Number of Voters
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

- a) Calculate Mean and Median of the data
- b) Find the skewness of the data and comment.

OR

- a) Calculate the five numbers used in Box Plot.
- b) Draw a box plot showing end points for inner fences and end points for outer fences.
