Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA – SEMESTER 01– • EXAMINATION – WINTER 2016

Subject Code:2810007 **Date: 02/01/2017**

Subject Name: Quantitative Analysis-I

Time: 10.30 a.m. to 01.30 p.m. **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Scientific calculator & statistical table (Z, t, F & chi square) are permitted.**

Q.1 (a) Answer all the following multiple choice questions. 06

1. The rejection and not rejection regions are divided by a point called the _____.
   A. Divisional value B. Critical value
   C. Rejection value D. Table value
2. The matched-pairs *t* test deals with _____.
   A. Independent samples B. Average sample
   C. Large sample D. Related sample
3. Analysis of variance tests use the _____.
   A. Z distribution B. t- distribution
   C. A distribution D. F distribution
4. A measure of the degree of relatedness of two variables is _____.
   A. Regression B. Correlation
   C. Degree of association D. Least square relationship
5. In regression, the predictor is called the _____.
   A. Dependent variable B. Independent variable
   C. Standard error D. R square
6. In regression analysis, R is also called the _____.
   A. Residual B. Co efficient of correlation
   C. Error D. Co efficient of determination

Q.1 (b) Define the following terms. 04

1. Mode
2. Co efficient of skewness
3. Independent events
4. Kurtosis

Q.1 (c) Explain Empirical rule for normally distributed data. 04

Q.2 (a) What is correlation? Determine the value of the coefficient of correlation for the following data. 07

X	158	296	87	110	436
Y	349	510	301	322	550

(b) According to the labor statistics in India, 75 % of the women of 25 to 50 years age group participate in labor force. Suppose 78 % of the women in that age group are married. Suppose also that 61% of all women of 25 to 50 years age group are married and are participating in the labor force. 07

What is the probability that a randomly selected woman in that age group is married or

is participating in the labor force? What is the probability that a randomly selected woman in that age group is neither married nor participating in the labor force?

OR

(b) In a manufacturing plant, machines A, B, and C all produce the same two parts, W and M. Of all the parts produced, machine A, produces 60 %, machine B produces 30 % and machine C produces 10 %. 40 % of the parts made by machine A are part W. 50 % of the parts made by machine B are part W and 70 % of the parts made by machine C are part W. A part produced by this company is randomly selected and is determined to be a W part. With the knowledge that it is an W part, revise the probabilities that the part came from machine A, B or C. 07

Q.3 (a) Explain mean, standard deviation, length of uniform distribution, height of uniform distribution and probabilities of uniform distribution. 07

(b) The Retail world lists the top 17 Indian retailers in annual sales. Star bazzar is number one followed by Big bazzar and Reliance Mart. Of the 17 retailers on the list, eight are in some type of private label related business. Suppose four firms are randomly selected. What is probability that none of the retailers are in some type of private label business? What is the probability that all four firms are in some type of private label business? 07

OR

Q.3 (a) Discuss any two non probability sampling methods. 07

(b) Suppose the average speeds of passenger trains traveling from Delhi to Ahmedabad are normally distributed. The mean average speed of 88 miles per hour and a standard deviation of 6.4 miles per hour. What is the probability that a train will average less than 70 miles per hour? What is the probability that a train will average more than 80 miles per hour? What is the probability that a train will average between 90 and 100 miles per hour? 07

Q.4 (a) Explain Co efficient of Determination and Standard error of estimate. 07

(b) A major auto manufacturer wants to know whether there is any difference in the average mileage of four different brands of tires, because the manufacturer is trying to select the best supplier in terms of tire durability. The manufacturer selects comparable levels of tires from each company and test some on comparable cars. The mileage results follow. 07

Brand A 31000, 25000, 28000, 29000, 32000, 27500
Brand B 24000, 25500, 27000, 26500, 25000, 28000, 27500
Brand C 30500, 28000, 32500, 28000, 31000
Brand D 24500, 27000, 26000, 21000, 25500, 26000

Use 0.05 significance level to test whether there is a significant difference in the mean mileage of these four brands. Assume tire mileage is normally distributed.

OR

Q.4 (a) Discuss the application of regression analysis in detail. 07

(b) Are the type of professional jobs held in the computing industry independent of the number of years a person has worked in the industry? Suppose 246 workers are interviewed. Use the results obtained to determine whether type of professional job held in the computer industry is independent of years worked in the industry. Use 0.01 significance level. 07

		Professional positions			
		Manager	Programmer	Operator	System Analyst
Years	0-3	6	37	11	13
	4-8	28	16	23	24
	>8	47	10	12	19

Q.5 The Environment protection agency (EPA) releases figures on urban air soot in selected cities in the India. For the city of Mumbai, the EPA claims that the average number of micrograms of suspended particles per cubic meter of air is 82. Suppose Mumbai officials have been working with businesses, commuters and industries to reduce this figure. These city officials hire an environmental company to take random measures of air soot over a period of several weeks. The resulting data from 32 measurements mention here. 14

81.6 66.6 70.9 82.5 58.3 71.6 72.4 96.6 78.6 76.1 80.0 73.2 85.5 73.2 68.6 61.7
74.0 68.7 83.0 86.9 94.9 75.6 77.3 86.6 71.7 88.5 87.0 72.5 83.0 85.8 74.9 92.2

Use these data to determine whether the urban air soot in Mumbai is significantly lower than it was when the EPA conducted its measurements. Use alpha 0.01.

OR

Q.5 Eleven employees were put under the care of the company nurse because of high cholesterol readings. The nurse lectured them on the dangers of this condition and put them on a new diet program. The following table is the cholesterol readings of the 11 employees both before the new diet and one month after use of the diet program. Make the statement of hypothesis. Test the hypothesis that the program was successful with its objective. Use 5 % significance level to test the hypothesis. Assume the differences in cholesterol readings are normally distributed in the population. 14

Employee	1	2	3	4	5	6	7	8	9	10	11
Before	255	230	290	242	300	250	215	230	225	219	236
After	197	225	215	215	240	235	190	240	200	203	223

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