

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA – SEMESTER 01– • EXAMINATION – SUMMER 2017

Subject Code: 2810007

Date: 08/05/2017

Subject Name: Quantitative Analysis-I

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.

Q.1 (a) Objective Questions

1. The sum of deviations about the arithmetic mean is always equal to _____ **6**
A. zero B. the variance
C. the mean absolute deviation D. the standard deviation
2. Which of the following is NOT a legitimate probability value?
A. 0.67 B. 15/16
C. 0.23 D. 4/3
3. The standard deviation of a sampling distribution is commonly called _____
A. statistical leverage B. the uniform spread
C. statistical margin D. the standard error
4. In regression analysis, the dependent variable is also known as the _____
A. predictor variable B. explanatory variable
C. exogenous variable D. response variable
5. A measure of the degree of relatedness of two variables is _____
A. regression B. correlation
C. residual D. least squares analysis
6. Given $P(A) = 0.40$, $P(B) = 0.50$, $P(A \cap B) = 0.15$. Find $P(A \cup B)$ _____
A. 0.90 B. 1.05
C. 0.75 D. 0.65

- Q.1 (b)**
1. Coefficient of Correlation
 2. Mutually Exclusive Events
 3. Standard Error of the Mean
 4. Sampling Error

04

- Q.1 (c)** Explain the term Kurtosis and types of Kurtosis with suitable examples.

04

- Q.2 (a)** Explain four level of data measurement with suitable examples

07

- (b)** Determine the Pearson Product-moment correlation coefficient for the following data

07

X	1	10	9	6	5	3	2
Y	8	4	4	5	7	7	9

OR

- (b) Construct a histogram and a frequency polygon for the following data.

07

Class	Interval Frequency
30–under 32	5
32–under 34	7
34–under 36	15
36–under 38	21
38–under 40	34
40–under 42	24
42–under 44	17
44–under 46	8

- Q.3 (a) Explain the three types of probability with suitable examples.

07

- (b) A random sample of voters in Rajkot is classified by age group, as shown by the following data.

07

Age	Group Frequency
18–under 24	17
24–under 30	22
30–under 36	26
36–under 42	35
42–under 48	33
48–under 54	30
54–under 60	32
60–under 66	21
66–under 72	15

- Calculate the mean of the data.
- Calculate the mode.
- Calculate the variance.
- Calculate the standard deviation.

OR

- Q.3 (a) A study by Khyati Research Associates for the NSE Market revealed that 43% of all Indian adults are stockholders. In addition, the study determined that 75% of all Indian adult stockholders have some college education. Suppose 37% of all Indian adults have some college education. An Indian adult is randomly selected.

07

- What is the probability that the adult does not own stock?
- What is the probability that the adult owns stock and has some college education?
- What is the probability that the adult owns stock or has some college education?
- What is the probability that the adult has neither some college education nor owns stock?
- What is the probability that the adult does not own stock or has no college education?
- What is the probability that the adult has some college education and owns no stock?

- (b) In the past few years, outsourcing overseas has become more frequently used than ever before by U.S. companies. However, outsourcing is not without problems. A recent survey by Purchasing indicates that 20% of the companies that outsource overseas use a consultant. Suppose 15 companies that outsource overseas are randomly selected.
- What is the probability that exactly five companies that outsource

07

overseas use a consultant?

b. What is the probability that more than nine companies that outsource overseas use a consultant?

c. What is the probability that none of the companies that outsource overseas use a consultant?

d. What is the probability that between four and seven (inclusive) companies that outsource overseas use a consultant?

- Q.4** (a) A population proportion is .58. Suppose a random sample of 660 items is sampled randomly from this population. **07**
- a. What is the probability that the sample proportion is greater than .60?
- b. What is the probability that the sample proportion is between .55 and .65?
- c. What is the probability that the sample proportion is greater than .57?
- d. What is the probability that the sample proportion is between .53 and .56?
- e. What is the probability that the sample proportion is less than .48?
- (b) Explain the different discrete distribution and continuous distribution with suitable examples. **07**

OR

- Q.4** (a) Explain in detailed on Sampling Techniques. **07**
- (b) The data below shown in table are related to randomly sample nine companies from the handbook of common stocks and records the P/E ratios of each of these companies at the end of the year 1 and at the end of year 2 are given below. **07**

Company	Year 1 P/E Ratio	Year 2 P/E Ratio
1	8.9	12.7
2	38.1	45.4
3	43.0	10.0
4	34.0	27.2
5	34.5	22.8
6	15.2	24.1
7	20.3	32.3
8	19.9	40.1
9	61.9	106.5

Use $\alpha = 0.01$ to test whether there is significant difference in the average P/E ratio between year 1 and year 2.

- Q.5** Amar Dairy would like to know whether the sales of milk are distributed uniformly over a year so they can plan for milk production and storage. In this situation, the producers are attempting to determine whether the amounts of milk sold are the same for each month of the year. They ascertain the number of gallons of milk sold by sampling one large supermarket each month during a year, obtaining the following data. **14**

Month	Gallons	Month	Gallons
January	1610	August	1350
February	1585	September	1495

March	1649	October	1564
April	1590	November	1602
May	1540	December	<u>1655</u>
June	1397	Total	18,477
July	1410		

Use $\alpha = 0.01$ to test whether the data fit a uniform distribution.

OR

Q.5

A company has three manufacturing plants, and company officials want to determine whether there is a difference in the average age of workers at the three locations. The following data are the ages of five randomly selected workers at each plant. Perform a one-way ANOVA to determine whether there is a significant difference in the mean ages of the workers at the three plants. Use $\alpha = 0.01$.

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<u>Plant (Employee Ages)</u>		
<u>1</u>	<u>2</u>	<u>3</u>
29	32	25
27	33	24
30	31	24
27	34	25
28	30	26
