

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MBA – SEMESTER 01– • EXAMINATION – SUMMER 2016****Subject Code: 2810007****Date: 21/05/2016****Subject Name: QUANTITATIVE ANALYSIS - I (QA-I)****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 (A) Answer the following questions with most appropriate options: 06**

- 1 The range of data set is 252 and the largest value in the observation is given by 396. What is the smallest value in the observation?  
A. 244 B. 236  
C. 136 D. 144
- 2 Which method of sampling is appropriate when the population consists of well-defined group such that the groups are similar to each other and there is considerable variation within groups?  
A. Systematic Sampling B. Simple Random Sampling  
C. Stratified Sampling D. Cluster Sampling
- 3 Which of the following is the correct representation of alternative hypothesis for right tailed test of mean using sample? ( $\mu_0$  = hypothesized value of the population mean)  
A.  $H_1: \mu = \mu_0$  B.  $H_1: \mu \neq \mu_0$   
C.  $H_1: \mu > \mu_0$  D.  $H_1: \mu < \mu_0$
- 4 A chi square can never be negative because,  
A. Differences between expected and observed frequencies are squared  
B. Observed and expected frequencies are always positive  
C. The absolute value of the difference is computed  
D. None of these
- 5 If the coefficient of correlation between two variables between -1 and 0 then covariance between them is  
A. Positive  
B. Negative  
C. Zero  
D. Lesser in magnitude than the variance of each of the variables.
- 6 The statistical measures like mean, median, mode and standard deviation which are used to describe the characteristics of a sample known as,  
A. Parameters B. Constants  
C. Statistics D. Measures

**(B) Answer the following questions with required calculations 04**

- 1 The probability distribution of possible returns of an investment is given below:

Return( $R_i$ )	5%	10%	20%	30%
Probability	0.20	0.30	0.40	0.10

What is the expected return on investment?

- 2 In the test of difference between two proportions, two samples are under consideration. In the first, a sample size of 250 shows 50 success, in the second sample size of 200 shows 60 successes. What is the value of  $\hat{P}$  for this situation?
- 3 For a simple linear regression equation  $\sum(Y - \hat{Y})^2 = 195.40$  and there are 20 pairs of observations, what is the standard error of estimate ?
- 4 If  $P(A) = P(B) = K$  and  $P(A \cap B) = P(A' \cap B') = 1/10$   
Find the value of K?

(C) Write a note on Simple Random Sampling 04

**Q.2** (A) What is statistics? Describe the various applications of statistics in various field of management? 07

(B) A study investigated the perception of corporate ethical values among individuals specializing in marketing area. Use 5% level of significance and test significant difference among three groups for following data: 07

Marketing Managers	6	8	7	6	4	9
Marketing Research	5	6	4	3	4	5
Advertising	6	7	6	5	7	8

**OR**

**Q.2** (B) 120 students are selected from the students enrolled in MBA programs were cross classified by age group and grade point. 07

Grade Point	Age			Total
	19-21	21-23	23-25	
Up to 7	12	28	10	50
7-8	10	50	15	75
Over 8	08	12	05	25
Total	30	90	30	150

1. Calculate a table of observed and expected frequency for the above information.
2. State null and alternative hypothesis.
3. Calculate chie square statistics.
4. At 5% significant level, what is your conclusion regarding age and grade point. Is there any association between age and grade point?

**Q.3** (A) Write a note on following : 07

1. Uniform Distribution
2. Hyper Geometric Distribution

(B) SUDA installed 20,000 LED lamps to reduce the electricity consumption and provide better facilities to the citizens of Surat in the western region. These lamps have an average life of 1800 burning hours with standard deviations of 300 hours. Assuming Normality, what number of LED lamps might be expected to fail? 07

1. In the first 1500 burning hours.
2. Between 1400 to 1700 hours.
3. After what period of burning hours would you expect that 2000 of the LED lamps would still be burning?

OR

- Q.3** (A) What is non random sampling? Explain any two methods of non random sampling. **07**
- (B) In India financial scenario is changed after the stable government is elected. In the last two quarters, our growth is positive, S&P has also improved the credit rating of our country. Even though 40% of the financial experts believe that still we are in recession. A sample of 10 independent financial experts are selected at random, find the probability that:
1. Note more than 2 financial experts think we are in recession.
  2. At least 5 financial experts think we are in recessions.
  3. How many financial experts would you expect to say we are in recession?
- Q.4** (A) Write a note on Type I and Type II error. **07**
- (B) A leading cola company fills cola 2 liter into bottles in an automatic bottling plant. A consumer advocate wants to test the null hypothesis that the average amount filled by the machine into bottle is at least 2 liter (2000 c.m.). A random sample of 40 bottles selected from the plant and exact content of selected bottles are recorded. The sample mean was 1999.6 c.m. The population standard deviation is known from past experience to be 1.30 c.m.
1. Test null hypothesis at 5% significance level.
  2. Assume that the population is normally distributed with the same  $S=1.30$  c.m. Assume that the sample size is only 20 and sample mean is same 1999.6 c.m. conduct the test once again with 5% level of significance. If there is a difference in two results, explain the reason for the difference.
  3. Derive confidence level and interpret the values.
- Q.4** (A) What is composite hypothesis? Write detailed note on one tailed test and two tailed test. **07**
- (B) Until few years ago, the market of consumer credit was considerable to be segmented. With higher income group, higher spending people tended to be HSBC platinum card holder and lower income and lower spending people were usually ICICI gold card holders. In the last few years, ICICI gold card has intensified its efforts to break into the higher income segment of the market by using magazine and television advertisement to create higher class image. A consulting firm was hired by ICICI to determine whether average monthly charges on HSBC platinum card are equal to average monthly charges by ICICI god card. A random sample of 1200 HSBC platinum card holders were selected and sample monthly charges was found to be Rs.452 with standard deviation of Rs.212. An independent sample of 800 gold ICICI card holders revealed a sample mean of Rs. 523 with standard deviation of Rs 185. Is there evidence to conclude that the average monthly charges in the entire population of HSBC platinum card holders Is different from the average monthly charges of ICICI gold card holders? Test the belief at 1% level of significance. **07**
- Q.5** “Hindustan transport corporation” a transport service provider company owned about 15,000 trucks. HTC Is known for safe and fast delivery of goods. The maintenance manager observed that several thousand rupees were being spent on maintenance of trucks of which majority expenditure was on tyre **14**

servicing. The tyres were being reliable. Sometimes the tyres had to be changed much before their life as claimed by the supplier, as the journey was long and the load to be born was high. The bumpy, zigzag and mountainous roads increase the threat to the tyre. However the maintenance manager felt that the quality of the tyres could be better when the purchasing manager conveyed this matter to the supplier company, "J.K.Traders Pvt Ltd" Ahmedabad. He bluntly turned it down. The marketing managers of J.K.Traders told that they were supplying the tyres of the best quality in the industry to HTC. The improvement in the quality can not be thought in the near future. With this negative response from J.K.Traders, HTC felt its supplier was becoming dominant and dictating the terms. Quality is a very crucial parameter which HTC never compromised with so, the managing director, Mr Karan directed Mr Yatharth to look out for alternative suppliers "Road star pvt ltd" and "King tyre pvt ltd". When the two suppliers of tyres tested in simulated environment, the results were as follows:

Life of Tyres (Thousand of KM)	Numbers of Tyres	
	Road Star Pvt. Ltd.	King Tyre Pvt Ltd
5-10	2	4
10-15	3	7
15-20	10	11
20-25	15	25
25-30	17	10
30-35	9	2
35-40	4	1

Find the following:

1. Construct histogram and frequency curve for both tyre suppliers, compare the symmetricness.
2. Compute and compare mean, median and mode life of the tyres supplied by the two suppliers and interpret the values.
3. Derive the standard deviation and variance of life of tyres supplied by the two suppliers.
4. Which supplier would you choose if you were the GM of HTC? Why? Justify your decision with appropriate quantitative tools.

**OR**

**Q.5** According to the Capital Asset Pricing Model (CAPM), the risk associated with a capital asset is proportional to the slope  $\beta_1$  (or simply  $\beta$  : Regression coefficient Y on X) obtained by regressing the assets past returns with the corresponding return of the average portfolio called the market portfolio. (The return of the market portfolio represents the return earned by the average investor. It is a weighted average of the returns from all the assets in the market. The larger the sloop of  $\beta$  on of an asset, the larger is the risk associated with that asset. A  $\beta$  of 1.00 represents average risk. The return from IT firm's stock and the corresponding returns for the market portfolio for the past 10 years are given below: **14**

Market Return (X)	16	12	11	17	14	13	18	15	08	10
Stock's	21	17	14	22	16	15	24	18	05	08

return (Y)										
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Answer the following questions:

1. What are the independent and dependent variables?
2. Construct scattered diagrams based on the relationship of market return and IT stock return and interpret the diagrams.
3. Carry out the regression and find the  $\beta$  for the stock. What is the regression equation?
4. Does the value of the slope indicate that the stock has above average risk? (in the range of  $1 \pm 0.1$ , interpret the risk.)
5. If the market portfolio return for the current year is 25%, what is the stocks return?
6. Calculate the coefficient of the determination and state its interpretation.

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