

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

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

GUJARAT TECHNOLOGICAL UNIVERSITY

**MBA I - SEMESTER - I EXAMINATION – WINTER • 2014**

**Subject Code: 2810007**

**Date: 29-12-2014**

**Subject Name: Quantitative Analysis - I (QA-I)**

**Time: 10:30 am - 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)** Answer the following multiple choice questions. **06**
1. Assume that a population has a  $\mu=100$  and  $\sigma=10$ . If particular observation has a standard score of 2, it can be concluded that
    - A. It lies between 80 and 120, but its exact value cannot be determined.
    - B. Its value is 120
    - C. Its value is greater than 120
    - D. Nothing can be determined without knowing N.
  2. For a normal curve with  $\mu=55$  and  $\sigma=10$ , how much area will be found under the curve to the right of the value 55?
    - A. 0.5
    - B. 1.0
    - C. 0.33
    - D. Cannot be determined from the information given.
  3. For a particular hypothesis test,  $\alpha=0.05$  and  $\beta=0.05$ . The power of hypothesis test is:
    - A. 0.95
    - B. 0.05
    - C. 0.15
    - D. None of these
  4. The value of  $r^2$  for particular situation is 0.81. What is the coefficient of correlation?
    - A. 0.81
    - B. 0.09
    - C. 0.9
    - D. Cannot be determined from the information given.
  5. If one event is unaffected by the outcome of another event, the two events are said to be
    - A. Mutually exclusive
    - B. Independent
    - C. Dependent
    - D. All of the above
  6. A BSF checkpoint that stops every passenger van is using
    - A. Simple random sampling
    - B. Cluster sampling
    - C. Stratified sampling
    - D. Complete enumeration
- Q.1 (b)** Briefly explain the following terms. **04**
1. Statistic and parameter
  2. Type I error
  3. Uniform Distribution
  4. Coefficient of variation

- Q.1 (c)** Explain Poisson distribution with example. **04**
- Q.2 (a)** Raju George, executive of customer relations for Apple airline, is studying his company's overbooking problem. He is concentrating on the three late night flights out of SVP Airport in Ahmedabad city. In the last year, 5, 6 and 7 percent of the passengers on the Mumbai, Delhi and Goa flights, respectively, have been bumped. Further, 50, 20 and 30 percent of the late night Apple airline passengers at SVP Airport take the Mumbai, Delhi and Goa flights, respectively. What is the probability that a bumped passenger was scheduled to be on the **07**
- A. Mumbai Flight  
B. Delhi Flight  
C. Goa Flight

- (b)** Nitrosoft estimated last year that 40 percent of potential software buyers were planning to wait to purchase the new operating system, Window Mak, until an upgrade had been released. After an advertising campaign to reassure the public, Nitrosoft surveyed 5000 people and found 1800 who were still unconvinced. At the 5 percent significance level, can the company conclude the proportion of unconvinced people has decreased? **07**

**OR**

- (b)** Ram Patel, a horticulturist at Agriculture university, knows that a certain strain of corn will always produce between 65 and 155 bushels per acre. For a confidence level of 95 percent, how many 1 –acre samples must be taken in order to estimate the average production per acre to within  $\pm 5$  bushels per acre? **07**

- Q.3 (a)** The city bank of Rajkot has recently begun a new credit program. Customers meeting certain credit requirements can obtain a credit card accepted by participating area merchants that carries a discount. Past number show that 30 percent of all applicants for this card are rejected. Given that credit acceptance or rejection is a Bernoulli process, out of 15 applicants, what is the probability that **07**
- A. Exactly 5 will be rejected?  
B. Exactly 9 will be rejected?  
C. Fewer than 2?  
D. More than 12?

- (b)** Explain four levels of data measurement in detail. **07**

**OR**

- Q.3 (a)** The India customs agency routinely checks all passengers arriving from foreign countries as they enter the India. The department reports that the number of people per day found to be carrying smuggled goods as they enter India through SVP airport in Ahmedabad averages 40 and has a standard deviation of 10. What is the probability that in 6 days at the airport, the average number of passengers found carrying smuggled goods will exceed 54? **07**
- (b)** Write a detailed note on different measures of central tendency. **07**

- Q.4 (a)** Discuss random and non-random sampling methods with examples. **07**
- (b)** ABC distributing company hypothesizes that a phone calls is more effective than an E –mail in speeding up collection of slow accounts. Two groups of slow accounts were contacted, one by each method, and the length of time between making the call or sending the E-mail and the receipt of payment was recorded:

<i>Methods used</i>	<i>Days to collection</i>						
<b>E-Mail</b>	10	8	9	11	11	14	10
<b>Phone Call</b>	7	4	5	4	8	6	9

**07**

At  $\alpha=0.05$ , should ABC conclude that slow accounts are collected more quickly with calls than with E-mail?

OR

Q.4 (a)

Write a short note on:

- Central limit theorem
- Criteria of good estimator

07

(b)

During recent tennis matches, Dipika has noticed that her lobs have been less than totally effective because her opponents have been returning more of them. Some of the people she plays are quite tall, so she was wondering whether the height of her opponents could be used to explain the number of lobs not returned during a match. The following data were collected from five recent matches.

<i>Opponent's height (H)</i>	<i>Unreturned Lobs (L)</i>
5 feet	9
5.5 feet	6
6 feet	3
6.5 feet	0
5 feet	7

07

- Which variable is the dependent variable?
- What is the least squared estimating equation for these data?
- What is your best estimate of the number of unreturned lobs in her match tomorrow with an opponent who is 5.6 feet tall?

Q.5

An investor is interested in seeing whether there are significant differences in the rates of returns on stocks, bonds, gold, silver, real estate and mutual funds. He has taken random samples of each type of investment and has recorded the following data.

Stocks	10	12	15	12	11	17	
Bonds	6	9	8	9	11		
Gold	15	20	4	20	10	12	
Silver	8	12	11	14	15	20	15
Real Estate	12	15	20	12	11	14	
Mutual Funds	20	25	23	24	20	22	

14

- State the null and alternate hypothesis
- Test your hypothesis at the 0.05 significance level.

OR

Q.5

An educator has the opinion that the grades college students make depend on the amount of time they spend chatting on chatapp. To test this theory, he has randomly given 1200 students a questionnaire. Within the questionnaire are the two questions: "how many hours per week do you chat on chatsapp?" and "what is the average grade for all your classes?". The data from the survey are in the following table. Using a 10 percent significance level, test whether grades and time spent chatting on chatsapp are independent or dependent.

14

Average Grade

<i>Hours spent chatting on chatsapp</i>	<b>AA</b>	<b>AB</b>	<b>BB</b>	<b>BC</b>	<b>CC</b>	<b>FF</b>
<b>&lt;2</b>	15	32	27	24	41	20
<b>2 to 9</b>	20	18	60	33	24	30
<b>10 to 19</b>	30	20	40	45	47	50
<b>20 to 29</b>	25	24	20	42	20	45
<b>30 to 39</b>	27	33	30	33	27	50
<b>40 to 49</b>	35	51	15	39	52	56

\*\*\*\*\*