

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MBA - SEMESTER-I • EXAMINATION – SUMMER • 2014

Subject Code: 810007

Date: 05-06-2014

Subject Name: Quantitative Analysis

Time: 14.30 pm – 17.30 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) Explain the following: **07**
(i) Baye's Theorem
(ii) Chebyshev's Theorem
(iii) Theory of Central tendency
- (b) Three machines producing 40%, 35% & 25% of the total output are known to produce with defective proportion of items as 0.04, 0.06 and 0.03 respectively. On a particular day, a unit of output is selected at random and is found to be defective. What is the probability that it was produced by the second machine? **07**

- Q.2** (a) An inspector in the Alpha Laval pipe line has the task of comparing the reliability of two pumping stations. Each station is susceptible to two kinds of failure: pump failure and leakage. When either (or both) occurs, the station must be shut down. The data at hand indicate that the following probabilities prevail: **07**

Station	P(pump failure)	P(leakage)	P(Both)
1	0.07	0.10	0
2	0.09	0.12	0.06

Which station has the higher probability of being shut down?

- (b) Explain the practical applications of business statistics / Quantitative analysis? **07**

OR

- (b) The number of Indian cars in service by top car rental companies in a recent year according to auto rental news as follows: **07**

Company	No of cars in
Tata Indica	460000
Maruti 800	350000
Alto	322000
Zen	220000
Swift	146000
Tata Nano	78000
Centro	51000
Volkswagon	15000
Ritz	12000
Nissan	12000
Chevrolet	12000
Fiat	8000
Eon	8000

Compute the mode, median and mean. Comment from the above, which one is better measure of central tendency for the given data? Why?

- Q.3** (a) The probability that a blade manufactured by a factory is defective is $1/500$. Blades are packed in packets of 10 blades. Find the expected number of packets containing (i) no defective blade (ii) one defective blade. **07**
- (b) A certain business school has 400 students in its MBA program. One hundred sixteen of students are married. Determine by using the binominal distribution. **07**
(1) The probability that exactly 2 of 3 randomly selected students is married.
(2) The probability that exactly 4 of 13 students' chosen at random are married.

OR

- Q.3 (a)** The mean number of patients admitted per day to the emergency room of a small hospital is 3.5. If on a given day, there are only five beds available for new patients, what is the probability the hospital will not have enough beds to accommodate its newly admitted patients? **07**

- (b)** Compute a one-way ANOVA on the following data. **07**

Sample -1	Sample-2	Sample-3
2	5	3
1	3	4
3	6	5
3	4	5
2	5	3
1	----	5

Determine the observed F value. Compare the observed F value with the critical table F value and decide whether to reject the null hypothesis. Use a 5% level of significance.

- Q.4 (a)** Use a chi-square goodness-of-fit test to determine whether the observed frequencies are distributed the same as the expected frequencies ($\alpha=.05$). **07**

Category	f ₀	f _e
I	53	68
II	37	42
III	32	33
IV	28	22
V	18	10
VI	15	08

- (b)** Differentiate between the following: **07**
 (i) Small sample test & large sample test – in hypothesis testing
 (ii) Type I error & Type II error

OR

- Q.4 (a)** Write a short note on: Index numbers. **07**
(b) What is random and nonrandom sampling? Explain. **07**

- Q.5 (a)** Calculate Laspeyres price indexes for 2000-2002 from the following data. Use 1995 as the base year. **07**

	1995	Price			
Items	Quantity	1995	2000	2001	2002
1	21	0.50	0.67	0.68	0.71
2	06	1.23	1.85	1.90	1.91
3	17	0.84	0.75	0.75	0.80
4	43	0.15	0.21	0.15	0.15

- (b)** Define hypothesis. What is Null hypothesis & Alternate hypothesis? Explain with an example. **07**

OR

- Q.5 (a)** Explain utility of study of Regression. From the following data, determine the equation of the regression line. **07**

X	12	21	28	08	20
Y	17	15	22	19	24

- (b)** Using the following data obtain the coefficient of correlation. **07**

X	12	21	28	08	20
Y	17	15	22	19	24
