

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA - SEMESTER-I • EXAMINATION – SUMMER • 2015

Subject Code: 810007

Date: 02-06-2015

Subject Name: Quantitative Analysis (QA)

Time: 14:30pm to 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) Discuss the four level of data measurement **07**

(b) A research agency administers a demographic survey of 100 Information Technology companies to determine their size of operations. During the survey each of them asked to report how many employees are working in their company. Following is the frequency distribution. **07**

No of employees working IT Company	No. of Companies
0 – 20	32
20 – 40	26
40 – 60	13
60 – 80	10
80 – 100	19

Calculate the mean, mode and the variance of the data.

Q.2 (a) In manufacturing plant, machine A produce 20% of certain products, machine B produce 30% of this products and machine C produce 50% of this products. 5% of machine A products are defective, 10% of machine B products are defective and 8% of machine C products are defective. The company inspector has just inspected a product from this plant and has found it to be defective. Determine the revised probabilities that the sampled products was produced by A, B or C. **07**

(b) According to Cellular Telecommunication Industry Association, the average local monthly cell phone bill is Rs.42.78. Suppose local monthly cell phone bills are normally distributed, with a standard deviation of Rs.11.35. **07**

(i)What is the probability that a randomly selected cell phone bill is more than Rs. 67.75?

(ii)What is the probability that a randomly selected cell phone bill is between Rs.30 and Rs.50?

(iii)What is the probability that a randomly selected cell phone bill is not more than Rs.25?

OR

(b) Determine inter quartile range for the following data. **07**

44 18 39 40 59 46 59 37 15 73 23 19 90 58 35 82 14 38 27 24 71 25 39 84 70

Q.3 (a) Define & explain different non probabilistic sampling techniques. **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) Write a detailed note on Steps of Hypothesis Testing. 07
- (b) Use the data given to test the following hypothesis 07
- $H_0 : \mu = 25$ $H_a : \mu \neq 25$
- Sample Mean = 28.1
- Size of Sample = 57
- Population standard deviation = 8.46
- Level of significance = 0.01

- Q.4** (a) 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 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 $\alpha = 0.01$ and note that the sample size are equal. 07

Plant (Employee Age)		
1	2	3
29	32	25
27	33	24
30	31	24
27	34	25
28	30	26

- (b) What is Type I and Type II error? Explain with examples 07

OR

- Q.4** (a) Use the following data and $\alpha = 0.01$ to determine whether the observed frequencies represent a uniform distribution. 07

Category	1	2	3	4	5	6	7	8
F_0	19	17	14	18	19	21	18	18

- (b) An urban planning group is interested in knowing the difference between the mean household incomes for two localities in a large metropolitan area. Independent random samples of households in the localities provided the following results. 07

Locality 1	Locality 2
Sample Size1 = 8	Sample Size2 = 12
Sample mean1 = Rs.15700	Sample Mean2 = Rs.14500
Sample SD1 = Rs.700	Sample SD2 = Rs. 850

For the above data, test the following hypothesis, $H_0 : \mu_1 - \mu_2 = 0$ against $H_1 : \mu_1 - \mu_2 \neq 0$ at $\alpha = 0.05$

Q.5 (a) Determine the equation of the regression line for the following data. **07**

X	15	08	19	12	5
Y	47	36	56	44	21

(b) Write a short note on Index numbers. **07**

OR

Q.5 (a) What is regression analysis? Discuss the application of regression in Business Decisions. **07**

(b) Use the decision table given below to select decision alternative with below mention decision making criteria. **07**

Decision Alternatives		State of Nature			
		S ₁	S ₂	S ₃	S ₄
	D ₁	50	70	120	110
	D ₂	80	20	75	100
	D ₃	20	45	30	60
	D ₄	100	85	-30	-20
	D ₅	0	-10	65	80

(1) Use the maximax criterion to determine which decision alternative to select.

(2) Use the maximin criterion to determine which decision alternative to select.
