Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA Semester –I Examination Dec'11- Jan'12

Subject code: 2810007 **Date: 10/01/2012**

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) In a society there are two clubs. 60% members of the society are members of club A and 29% members of the society are member of club B while 13% members of the society are member of both clubs. Suppose if one society member is selected at random, 07

(i) What is the probability that he is member of club A or club B?

(ii) What is the probability that he is neither member of club a nor club B?

(iii) What is the probability that he is not the member of club A but member of club B?

(b) A company is producing the personal computers have shipped 16 computers, knowing that four of them have defective wiring. The purchaser wants to inspect three the computers for its wiring. What is the probability that the purchaser finds following 07

(i)No defective computers.

(ii)Exactly three defective computers.

Q.2 (a) Suppose that for years the mean of population I has accepted to be the same as the mean of population II, but that now population I is believed to have a greater mean than population II. Letting $\alpha = 0.05$ and assuming the populations have equal variances and x is approximately normally distributed, use the following data to test this belief. 07

Sample I : 43.6 45.7 44.0 49.1 45.2 45.6 40.8 46.5
48.3 45.0

Sample II :40.1 36.4 42.2 42.3 43.1 38.8 37.5 43.3
41.0 40.2

(b) Determine interquartile 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

OR

(b) The following data are the result of a historical study of the number of flows found in a porcelain cup produced by manufacturing firm. Use these data and the associated probabilities to compute the expected number of flaws and the standard deviation of flaws. 07

Flaws	Probability
0	0.461
1	0.285
2	0.129
3	0.087
4	0.038

Q.3 (a) From the following table check if the Variable 1 is independent of Variable 2. Take $\alpha = 0.01$. 07

	Variable 2			
Variable 1	24	13	47	58
	93	59	187	244

(b) A pen company averages 1.2 defective pens per carton produced. The number of defects per carton is Poisson distributed. If the each carton is of 200 pens, find following probabilities. 07
(i)Randomly selected carton do not have any defective pen
(ii)Randomly selected carton is having 8 or more defective pens.

OR

Q.3 (a) Perform one way analysis of variance for following data. 07

1	2	3	4
113	120	132	122
121	127	130	118
117	125	129	125
110	129	135	125

(b) According to Cellular Telecommunication Industry Association, the average local monthly cell phone bill is \$42.78. Suppose local monthly cell phone bills are normally distributed, with a standard deviation of \$11.35. 07
(i)What is the probability that a randomly selected cell phone bill is more than \$67.75.
(ii)What is the probability that a randomly selected cell phone bill is between \$30 and \$50.
(iii)What is the probability that a randomly selected cell phone bill is not more than \$25.

Q.4 (a) What is hypothesis? Describe types of hypothesis and process of hypothesis testing. 07
(b) For the following data estimate the regression equation of Y on X. 07

X	61	63	67	69	70	74	76	81	86	91	95	97
Y	4.28	4.08	4.42	4.17	4.48	4.30	4.82	4.70	5.11	5.13	5.64	5.56

OR

Q.4 (a) Use the following data to test the hypothesis : Ho : $\mu1-\mu2=0$ Ha : $\mu1-\mu2 \neq 0$ 07
($\alpha = 0.05$)

Sample 1		
90	88	80
88	87	91
81	84	84
88	90	91
89	95	97
88	83	94
81	83	88
87	87	93
88	84	83
95	93	97

Sample 2		
78	85	82
90	80	76
77	75	79
82	83	88
80	90	74
81	75	76
83	88	77
86	90	75
80	80	74
89	84	79

(b) Estimate the regression line and find residual of y. 07

X	12	21	28	8	20
Y	17	15	22	19	24

Q.5 (a) (1) Compute Q1 and P24 for following observations. 03
16 28 29 13 17 20 11 34 32 27 25 30 19 18 33
(2) Write short note on Systematic Random Sampling. 04

(b) (1) Explain one tailed and two tailed test. 03
(2) Write short note autocorrelation. 04

OR

Q.5 (a) (1) Calculate the value of ${}^5C_3$ and ${}^6P_3$. 03
(2) Write short note on snowball sampling and quota sampling. 04

(b) (1) Using given information obtain confidence interval to estimate p_1-p_2. 03
$n_1 = 430$, $n_2 = 399$, $x_1 = 275$, $x_2 = 275$, level of confidence = 85%.
(2) Write short note on chi square test of goodness of fit. 04

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