Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.B.A -Ist SEMESTER–EXAMINATION –JUNE- 2012

Subject code: 2810007 **Date: 14/06/2012**

Subject Name: Quantitative Analysis-I (QA-1)

Time: 02:30 pm – 05:30 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 telemarketing companies to determine their size of operations. During the survey each of them asked to report how many employees now work in their telemarketing operation. Following is the frequency distribution. 07

No. of Employees working in Telemarketing	No. of companies
0-20	32
20-40	16
40-60	13
60-80	10
80-100	19

Calculate the mean, mode and variance for the data.

Q.2 (a) The recent census study derives that 0.6 of all Indian household have ceiling fans. 29 % of all households have an exhaust fans. Suppose 0.13 of all Indian households have both a ceiling fan and an exhaust fan. If a household is randomly selected, what is probability that the household has a ceiling fan or an exhaust fan? What is the probability that the household has neither a ceiling fan nor an exhaust fan? What is the probability that the household does have a ceiling fan and does not have an exhaust fan? 07

(b) A movement of Food and Health department found approximately 0.27 of all ready to eat food products did not carry nutritional labeling, whereas 83 % of bakery products did not carry nutritional labeling. If these two categories combined, 60% would be ready to eat food and 40% would be bakery products. A researcher is blindly given a product from these two categories and is told that the product does not have nutritional labeling, revise the probability that the product is a ready to eat product. 07

OR

(b) A leading journal on economics publishes some statistics on the job market. 40% of all workers say they would change their job for higher pay. 88% companies say that there is a shortage of qualified candidates. Suppose 16 workers are randomly contacted and asked if they would change jobs for higher pay, what is the probability that nine or more say yes? If 13 companies selected, what is the probability that all of the companies say there is a shortage of qualified candidates? 07

Q.3 (a) Differentiate Random and Non Random Sampling. 03

(b) The Poisson distribution of annual trips per family to amusement parks gives average of 0.6 trips per year. What is the probability of randomly selected family did not make a trip to an amusement park last year? What is the probability of randomly selected family took three or fewer trips to amusement parks over a three years period? 04

(c) Mukta arts., a bolywood casting company, is selecting a group of extras for a movie. The ages of the first 20 men to be interviewed are 07

50	56	55	49	52	57	56	57
56	59	54	55	61	60	51	59
62	52	54	49				

The director of the movie wants men whose ages are fairly tightly grouped around 55 years. Being a statistics buff of sorts, the director suggests that a standard deviation of 3 years would be acceptable. Does this group of extras qualify?

OR

Q.3 (a) Eklavya pvt. Ltd. is developing a compact kidney dialysis machine, but its chief manager, is having trouble controlling the variability of the rate at which fluid moves through the device. Medical standards require that hourly flow be 4 liters, plus or minus 0.1 liter, 80 percent of the time. Manager in testing the prototype has found that 68 percent of the time, the hourly flow is within 0.08 liter of 4.02 liters. Does the prototype satisfy the medical standards? 05

(b) According to a study by agency, 0.21 of the credit card users are very close to their limit of credit card. Suppose a random sample of 600 card users is taken. What is the probability that more than 150 credit card users are very close to the total limit on their cards? 05

(c) A company has developed a new CFL bulb that seems to burn longer than most residential bulbs. To determine how long these bulb burn, the company randomly selects a sample of these CFLs and burn them in the laboratory. The output shown here is a portion of the analysis from this effort. 04

Mean: 2198 hrs
Standard deviation: 153 hrs
Sample size: 84
Confidence level (90%): 27.77
Discuss the output.

Q.4 (a) Write a short note on Type I error and Type II error 07

(b) Fun Republic knows that a certain hit movie ran an average of 84 days in each city, and the corresponding standard deviation was 10 days. The manager of the Mumbai region was interested in comparing the movie's popularity in his region with that all of India's other theaters. He randomly chose 75 theaters in his region and found that they ran the movie an average of 81.5 days. State appropriate hypothesis for testing whether there was a significant difference in the length of the picture's run between Fun republic in the Mumbai district and all of India's other theaters. At a 1 percent significance level, test these hypotheses. 07

OR

Q.4 (a) According to a study conducted in India, 59% of men and 70% of women say that Value for money is very important factor in purchasing Apparels. Suppose this survey was conducted using 374 men and 481 women, do these data show enough evidence to declare that a significantly higher proportion of women than men believe that Value for money is very important factor in purchasing Apparels? Use a 5% significance level. 07

(b) National Economics and Statistics agency claimed that the average retail onion price was Rs. 2.51/kg. Suppose a survey of 27 retailers is conducted this year to determine whether the price of onion has increased. The average price found after the study was Rs. 2.55/kg and variance was 0.022. Use alpha of 0.05 to test the assumption. 07

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

(b) Is the Brand preference of Laptop is independent of the Social class category? Suppose respondents randomly selected from respective class categories and classified in the following table. Use a chi-square test using significance level of 0.05. 07

Brand	Social Class-1	Social Class-2	Social Class-3
A	25	178	31
B	49	141	12
C	31	54	8
D	22	14	6

OR

Q.5 (a) Discuss the relationship between r and r^2 04

(b) The starting salaries of new MBA graduate would differ according to city of Gujarat. A random selection of five MBA graduates is taken from each city (Ahmedabad, Surat and Baroda). The data obtained follow. Use a One Way Anova to analyse these data at 0.05 level of significance. Salaries mentioned are in multiple of Rs. 10,000. 10

Ahmedabad	Surat	Baroda
3.05	4.1	3.55
3.15	3.95	3.35
3.00	3.9	3.5
3.1	3.8	3.65
3.15	3.95	3.6

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