Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA. Sem-I Regular Examination January/ February 2011

Subject code: 810007 **Subject Name: Quantitative Analysis**

Date: 05 /02 /2011 **Time: 10.30 am – 01.00 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)** What are the essential differences among nominal, ordinal, interval and ration scales? **07**

(b) Assume that the daily demand for unleaded gasoline at a service station is normally distributed with a mean of 25000 gallons and a standard deviation of 5000 gallons. **07**

a. What are the chances that daily demand will exceed 30000 gallons?
b. What are the chances that the daily demand will be less than 15000 gallons?
c. Between what two amounts would you expect 95% of the daily demands to lie?

Q.2 **(a)** What is random and non random sampling? Explain? **07**

(b) Mr. Patel applies for a housing loan of Rs. 15, 00,000 from a bank for new house. The bank informed him that over the years, the bank has received about 2920 loan applications per year and that the probability of approval was on was 0.92. **07**

a) Mr. Patel wants to know the average and standard deviation of the number of loans approved per year
b) Suppose bank actually received 2850 loan applications per year with an approval probability of 0.92. What are the mean and standard deviation now?

OR

(b) A company is in a process of appointing a new CEO. The president (production), president (marketing), and president (personnel) are in a race, and the probability that any one among the three gets appointed is in the proportion of 5:3:2 respectively. The probability that president (production) if selected will introduce the voluntary retirement scheme (VRS) is 0.4.The probabilities that the two if selected will introduce the VRS scheme are 0.6 and 0.8 respectively. What is the probability that VRS will be implemented? **07**

Q.3 **(a)** Suppose that a toy manufacturer offers a rebate in order to determine what customers are actually paying (after discounts) for a product. The manufacturer receives 1600 sales receipts back from customers in connection with rebate offer. Assume that the mean purchase price is Rs.25.00 with a standard deviation of Rs.3.00. **07**

a. Construct a 95% confidence interval for the purchase price.
b. Construct a 90% confidence interval for the purchase price.

(b) In future, the New York Times decides its survey must have a margin or error no greater than 1.2%, with confidence level 95%. What sample size do they need to achieve this? **07**

OR

Q.3 **(a)** A real estate agent claims that the average price of a Flat in Ahmedabad is at most Rs.50, 000. The standard deviation is s = Rs.8, 500. A sample of 81 condominiums has an average selling price of Rs.51, 500. Use $\alpha = 0.10$ level of significance to test the claim. **07**

(b) A team of eye surgeons has developed a new technique for a risky eye operation to restore the sight of people blinded from certain disease. Under the old method, it is known that only 30 % of the patients who undergo this operation recover their eyesight. Suppose that surgeons in various hospitals have performed a total of 225 operations using the new method and that 88 have been successful (the patients fully recovered their sight). Can we justify the claim that the new method is better than the old one? (Use a 1% level of significance). **07**

Q.4 **(a)** A regular *Times New* poll includes the question, "Do you approve or disapprove of the way Mr. Prime Minister is handling foreign policy?" In a recent poll, there were 1,131 respondents, of whom 37% answered "approve" and 56% answered "disapprove"(the other 7% either didn't answer or said they had no opinion). **07**

a. Construct a 90% confidence interval of the true proportion of the population who approve of Mr. Prime Minister's foreign policy.
b. Does this poll contain convincing evidence that more people disapprove than approve? Explain.

(b) Suppose we want to perform an ANOVA test to determine if I = 4 types of sleep inducers have the same mean time-till-sleep. We time how long (in minutes) it takes each sleep inducer to put J = 5 people to sleep, and our observed data is summarized in the table below: **07**

Inducer	Sleeping Pills	Sloths	Statistics Faculty	Statistics Text Books
Sample Mean	5.08	5.14	5.71	5.47
Sample SD	0.463	0.405	0.372	0.399

Use this data to test the null hypothesis "all sleep inducers are equally effective" at level of significance of 0.05.

OR

Q.4 **(a)** Describe in your own words the purpose of Simple Linear Regression. **07**

(b) In Consumer marketing, common problem the marketing manager encounter is selection of the appropriate package design. Assume that, a marketer wishes to compare five different package designs; he is interested in knowing which the most preferred one is so that the same can be introduced in the market. Random sample of 200 customers gives the following picture. **07**

Package design	Preference by the consumer
A	36
B	52
C	40
D	35
E	37
TOTAL	200

Do the consumer preferences for the designs show any significance differences?

Q.5 **(a)** Multiple regression often provides a more adequate way of modeling complex business situation than simple linear regression. Explain this statement. **07**

(b) 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**

OR

Q.5 **(a)** Explain the components of Time Series Analysis? **07**

(b) A small group of investors is considering planting a tree farm. Their choices are (1) don't plant trees, (2) plant a small number of trees, or (3) plant a large number of trees. The investors are concerned about the demand for trees. If demand for trees declines, planting a large tree farm would probably result in a loss. However, if a large increase in the demand for trees occurs, not planting a tree farm could mean a large loss in revenue opportunity. They determine that three states of demand are possible: (1) demand declines, (2) demand remains the same as it is, and (3) demand increases. Use the following decision table to compute an expected monetary value for this decision opportunity. **07**

	State of Demand($)		
Decision Alternatives	Decline(0.20)	Same(0.30)	Increase(0.50)
Don't Plant	20	0	-40
Small Tree Plant	90	10	175
Large Tree Plant	600	150	800

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