GUJARAT TECHNOLOGICAL UNIVERSITY
MBA Second Semester-II (Evening) Examination May 2010
Subject code: 810007
Subject Name: Quantitative Analysis

Date: 28 / 05 / 2010   **Time: 11.00 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)** For a given set of observations assumed to be normally distributed, mean=μ=40 units **07**
and standard deviation = σ =5 units. What does the empirical rule indicate for the
interval [μ-2σ , μ+2σ] ? Explain the meaning of what you state in this connection
State Chebyshev's rule.in this context and compare your results with that of
empirical rules.

(b) Explain the following terms giving salient features.   **07**
   (1) Uniform Distribution
   (2) Standard Error
   (3) Goodness -of – Fit test

Q.2 **(a)** Explain the following concepts in context to 'Testing of Hypothesis'   **07**
   (1) Null Hypothesis and Alternative Hypothesis.
   (2) Level of Significance and types of error.
   (3) Rejection and non-rejection regions.

(b) Solve the following case.   **07**
 In order to find the importance of customer service, a survey was made on a 5
point scale.[1 being low and 5 being high.]The mean was found to be 4.30. Another
team of researchers feel that the figure [mean] obtained was high and just to
establish that they made another survey. The results are as follows.

3   4   5   5   4   5   5   4   4   4   4
4   4   4   4   5   4   4   4   3   4   4
4   3   5   4   4   5   4   4   4   5

Give your view about the survey results of research team's decision taking α = 0.05

OR

(b) The following data (in K.G.) related to weights of machine parts follow normal   **07**
distribution. The production manager claims that the machine part, on an average is
8.3 K.G. A sample from the production was taken and the weights of each one of
the part is as given below.

8.1   8.4   8.3   8.2   8.5   8.6   8.4   8.3
8.4   8.2   8.8   8.2   8.2   8.2   8.1   8.3
8.4   8.5   8.5   8.7

Take α = 0.01 and verify production manager's claim

Q.3 **(a)** Two different samples are taken from two different normally distributed   **07**
populations.   test the following hypothesis of the difference in population means
by using the   following data. [Take level of significance = 0.10]

H_0 : μ_1- μ_2 = 0 H_1: μ_1- μ_2 < 0
         sample 1   sample 2

$\bar{x}_1$ =51.3 $\bar{x}_2$ = 53.2
S_1^2 = 52 S_2^2 = 60
n_1 = 31 n_2 = 32

(b) To study the effects of inflation on stock market a researcher takes the P/E ratios of 9 companies for the year 2004 and the same 9 companies for the year 2005. **07**

Company	P/E ratio 2004	P/E ratio 2005
1	8.9	12.7
2	38.1	45.4
3	43	10
4	34	27.2
5	34.5	22.8
6	15.2	24.1
7	20.3	32.3
8	19.9	40.1
9	61.9	106.5

Using the above records you are required to give your opinion regarding effect of inflation on the P/E ratio based on testing of hypothesis

OR

Q.3 **(a)** A study of female entrepreneurs was conducted to determine their definition of success. The women were offered optional choices such as happiness/ self-fulfillment, sales/profit, and achievement/ challenge. The women were divided into groups according to the gross sales of their businesses. A significantly higher proportion of them in the Rs. 100,000 to 500,000 category than in the less than Rs. 100,000 category seemed to rate sales/profit as a definition of success. **07**

Suppose you decide to test this result by taking a survey of your own and identify female entrepreneurs by gross sales. You interview 100 female entrepreneurs with gross sales of less than 100,000 and 24 of them define sales/profit as success. You then interview 95 females from the group with the gross sales of Rs. 100,000 to Rs. 500,000 and 39 cite sales/profit as a definition of success. Use this information to test with level of significance 0.01 to determine whether there is a significant difference in their participation of the two groups that define success as sales /profit.

(b) Explain usefulness of C.V. (coefficient of variation) Compare the following two sets of data for consistency. **07**

Data set I	Data set II
49	159
82	121
77	138
54	152

Q.4 **(a)** Give the salient features of the following concepts.[Draw necessary figures and highlight the features.] **07**
(1) Skewness. (2) Kurtosis (3) Positive and negative correlation

(b) Explain the following terms in context of probability. **07**
  (1) Conditional probability
  (2) Independent Events
  (3) Solve the following problem.
Machines A, B, and C produce the same two parts X and Y with the estimated contribution percentages 60% , 30% , and 10%.In addition to this we know that 40% of the parts produced by machine A are parts X ,while 50% and 70% produced by machines B and C respectively are parts X. A part is randomly taken from the total production and found it to be part X. What is the probability that the part is produced by machine C ?

OR

Q.4 **(a)** The manager of a leading publication, using the results of a survey, expects that rating given by the readers should be as given below. **07**
  (1) excellent 8% (2) pretty good 47% (3) only fair 34% (4) poor 11%
In order to verify the truth value of the % given above, a researcher conducts a survey and the corresponding results are as follows.

	Rating	Frequency
(1)	Excellent	21
(2)	Pretty good	109
(3)	Only Fair	62
(4)	poor	15

Does this observed reading agree with the manager's expectations?
[Take level of significance = 0.05]

(b) Using the following data obtain the equation of regression line.   **07**

x	Y
22	17
21	15
28	22
8	19
20	24

Q.5 (a) Explain the term 'Time series'. What are the basic components of a time series? Draw the diagram and explain each one. Using the following data compute a 4-month moving average for all available months.   **07**

Month	Production	Month	Production
1	1056	7	1110
2	1345	8	1334
3	1381	9	1416
4	1191	10	1282
5	1259	11	1341
6	1361	12	1382

(b) Calculate Laspeyre's and Passche's price index using the following data   **07**

Item	Price -2006	Quantity	Price-2007	Quantity
1	6.70	150	6.95	135
2	1.35	60	1.45	65
3	5.10	8	6.25	12
4	4.50	25	4.95	30
5	11.95	6	13.20	7
6	7.90	4	9.00	2

OR

Q.5 (a) Assuming that the trend is absent, determine, if any, seasonality in the given data.   **07**

YEAR	1	2	3	4
2000	3.7	4.1	3.3	3.5
2001	3.7	3.9	3.6	3.6
2002	4.3	4.1	3.3	3.1
2003	3.3	4.4.	4.0	4.0

(b) A news-paper boy keeps a record of number of newspaper demanded by certain group of people. A record of 100 days is show n below.   **07**

Copies-demanded	days
10	20
11	30
12	40
13	10

The cost of a copy to him is Rs. 1.00 while he sells each for Rs. 2/00.
Assuming that loss of sale not to be criteria for decision making, you are requested
to guide him to purchase number of copies for sale on each day.

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