K J SOMAIYA INSTITUTE OF MANAGEMENT STUDIES & RESEARCH
PGDMIBTRIMESTER(I) ENDTERM EXAMINATION
BUSINESS STATISTICS

TIME DURATION: 3 Hours   **TOTAL MARKS: 50**   **Date :24/09/2016**

NOTE:

1. Write detail analysis in the answer sheet.
2. Name excel output file as PGDMIB/RM-ROLL NUMBER, e.g. PGDMIB-10
3. Kindly make assumptions, if any.
4. All questions carry equal mark(10 M)
5. Attempt any 4 questions from Q 1 to Q 5
6. **Question 6 is compulsory**

Q.1. In a recent survey, 10 percent of the participants rated Pepsi as being "Concerned with my health." PepsiCo's response included a new "Smart Spot" symbol on its products that meet certain nutrition criteria, to help consumers who seek more healthful eating options. At $\alpha =.04$, would a follow-up survey showing that 14 of 100 persons now rate Pepsi as being "Concerned with my health" prove that the percentage has increased? Is the result sensitive to the choice of α?

Q.2. An investor has $100,000 to invest in the stock market. She is interested in developing a stock portfolio made up of General Electric, General Motors, McDonald's, and Motorola. However, she doesn't know how much to invest in each one. She wants to maximize her return, but she would also like to minimize the risk. She has computed the monthly returns for all four stocks and has recorded in the excel file **PORTFOLIO** .

After some consideration, she narrowed her choices down to the following three. What should she do?

1. $25,000 in each stock

2. General Electric: $10,000, General Motors: $20,000, McDonald's: $30,000, Motorola: $40,000

3. General Electric: $10,000, General Motors: $50,000, McDonald's: $30,000, Motorola: $10,000

Q.3.In an American National Election Survey (ANES), people were asked to indicate the amount of time they spent in a typical day receiving news about the election on the internet (TIME 1) and on television (TIME 2). Compare the two amounts of time by drawing Box and whisker plot and describe it. If you apply empirical rule, do you have similar results? (Refer to excel sheet   **TIME**)

Q4. Considering the Consumer Food database, is the mean annual food spending for a household in the Midwest region

more than $8,000 at 1% significance level? Is the conclusion sensitive to the choice of α? Estimate the annual food spending.(Refer **FOOD** excel sheet)

Q5. The weekly food expenditure for large families (families with at least 2 children) in London is known to be normally distributed with mean £155 and a standard deviation of £32.

1. What is the probability that a randomly selected large family spends less than £110
2. What is the probability that a randomly selected large family spends more than £225 on food per week?
3. What is the probability that a randomly selected large family spends between £ 115 and £210 per week?
4. What expenditure corresponds to 92nd percentile?
5. If a random sample of 420 large families in London is considered what is the probability of   families spending less than £225?

Q.6.**Compulsory question**

A. Suppose that the waiting time for a license plate renewal at a local office of a state motor vehicle department has been found normally distributed with a mean of 30 minutes and a standard deviation of 8 minutes. Suppose that in an effort to provide better service to the public, the director of the local office is permitted to provide discounts to those individuals whose waiting time exceeds a predetermined time. The director decides that 15% of the customers should receive this discount. What are the numbers of minutes they need to wait to receive the discount?

B. Suppose that 60 percent of the voters in a particular region support a candidate. Find the probability that a sample of 1,000 voters would yield a sample proportion in favor of the candidate within 2 percentage points.

C. We want to estimate with 99 percent confidence the percentage of buyers of cars who are under 30 years of age. A margin of error of 5 percentage points is desired, what sample size is needed?

D. Explain Central limit theorem.