Somaiya Institute of Management and Research Studies
PGDM-RM - I Trimester 2017 - 19
Business Statistics

Time: 3 hours **Marks : 50** **Date : 04/10/2017**

Note: Read the instruction carefully

- *Attempt **any 5**questions. All question carries equal marks (10 each)*
- *All answers to be given in the **Excel sheet only (stepwise)***
- *Save Excel sheet as Rno.-Name-IB (EX: **27-shwetadixit-RM**)*

Q1.1 How does the government spend the tax dollars they collect, and has this changed over past 15 years? The following table displays the amounts spent by federal, state, and local governments on consumption expenditure and gross investments. Consumption expenditures are services (such as education). Gross investments ($billions) consists of expenditure on fixed assets (such as roads, bridges and highways). Use a graphical figure technique to present these figures. Have the ways government spent money has changed over the previous 15 years?

	1990	**1995**	**2000**	**2004**
National defense: Consumption	308.1	297.3	321.5	477.5
National defense: Gross	65.9	51.4	48.8	70.4
Non-defense: Consumption	111.7	143.2	177.8	227.0
Non-defense: Gross	22.6	27.3	30.7	35.0
State and local: Consumption	544.6	696.1	917.8	1099.7
State and local: Gross	127.2	154.0	225.0	274.3

Q1.2. The table given in EXCEL(Q1.2) sheet lists the percentage of single and married women in the United States who had jobs outside the home during the period 1970 to 2007.

a. Construct a chart that shows that the percentage of married women who are working outside the home has not changed much in past 47 years.
b. Use a chart to show that the percentage of single women in the workforce force has increased “dramatically”

Q2. The temperature in December in Buffalo, New York is often below 40 degree Fahrenheit (4 degrees Celsius). Not surprisingly when the national football league Buffalo plays at home in December, hot coffee is a popular item at the concession stand. The concession manager would like to acquire more information so that he can manage inventory more efficiently. The no. of cups of coffee sold during 50 games played in December in Buffalo was recorded in Excel worksheet (Q2).

a. Compute mean and median of these data

b. Comment about Skewness using (a)
c. Compute Standard deviation, CV. Comment.

Q3.1 A statistics professor believes that there is relationship between the no. of missed classes and the grade on his mid-term test. After examining his records, he produced the following table of joint probabilities:

	Student fails the test	Student passes the test
Student misses fewer than 5 classes	0.02	0.86
Student misses 5 or more classes	0.09	0.03

a. What is the pass rate on mid-term test?
b. What proportion of students, who miss 5 or more classes, passes the mid-term test?
c. What proportions of students who miss fewer than 5 classes, passes the mid-term test?
d. What is proportion of students who fails in the test and have misses 5 or more classes?
e. Are the events independent?

Q3.2. Customer 's arrival for inquiring about an insurance plan in a company are random and independent, the probability of an arrival in any one minute period is same as the probability of arrival in any other one minute period. Answer the following questions assuming a mean arrival rate of 3 customers per minutes.

a) What is the probability of exactly four customers in a one minute period?
b) What is the probability of at most three customers in a one minute period?

Q4.1 Because of the relatively high interest rates most of the credit card holders pay off their bills promptly. However this is not always possible. An analysis of the amount of interest paid monthly by a bank's visa card holder reveals that the amount is normally distributed with a mean of $27 and standard deviation of $7.

a. What proportion of banks visa cardholders pay more than $30 in interest?
b. What proportion of the banks visa cardholders between $30 and $40 in interest?
c. What proportion of banks visa cardholders pay less than $15 in interest?
d. What interest payment is exceeded by only 20% of the banks visa card holders?

Q4.2 The Dutch consumer-electronics giant, Philips, is protected against takeovers by a unique corporate voting structure that gives power only to a few trusted shareholders. A decision of whether to dump the loss-producing German electronics firm Grunding, had to be made. The decision required a simple majority of nine decision-making shareholders. If each is believed to have a 0.25 probability of voting yes on the issue, what is the probability that Grunding will be dumped?

Q5.1 The HAL Corporation wishes to improve the resistance of its personal computer to disk-drive and keyboard failures. At present, the design of the computer is such that disk-drive failures occur only one-third as often as keyboard failures. The probability of simultaneous disk-drive and keyboard failures is 0.05. If the computer is 80 percent resistant to disk-drive and/or keyboard failure, how low must the disk-drive failure probability be?

Q5.2. A market research organization claims that 60% of all the house wives in a certain area prefer Brand **A** cleanser to all competing brands. Out of 5 housewives selected, what is the probability that

a. No one uses this brand?

b. At least 4 do not use this brand

c. Less than 3 use this brand

d. All uses this brand.

Q6. Attempting to analyze the relationship between advertising and sales, the owner of the furniture store recorded the monthly advertising budget ($ thousands) and the sakes ($ millions) for a sample of 12 months. The data are listed here:

Advertising	23	46	60	54	28	33
sales	9.6	11.3	12.8	9.8	8.9	12.5

Advertising	25	31	36	88	90	99
sales	12.0	11.4	12.6	13.7	14.4	15.9

a. Develop a scatter plot for the data with advertising as independent variable.
b. What does the scatter diagram developed in part (a) indicate about the relationship between both variables?
c. Provide an interpretation for the coefficient of determination.
d. Predict the bonus for an advertising expenditure of 30,000.