

Somaiya Institute of Management and Research Studies

PGDM-IB - 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-IB)*

Q1.1. The educational level of adults changed over past 15 years? To help answer this question, the bureau of Labor statistics compiled the following table; it lists the (1000) no. of adults 25 years of age and older who are employed. Use a graphical figure technique to present these figures. Briefly describe what your chart tells you?

	Year 1995	Year 1999	Year 2003	Year 2007
Less than high school	12,021	12,110	12,646	12,408
High school	36,746	35,335	33,792	32,634
Some college	30,908	30,401	30,338	30,389
College graduate	31,176	33,651	35,454	37,321

Q1.2. The table given below lists the average test score in scholastic assessment test (SAT) for the years 1967, 1970, 1975, 1980, 1985, 1990, 1995 and 1997 to 2007.

Draw the chart for the following:

- a. You wish to know both the verbal and mathematical test scores for all the students have not changed much over the years.
- b. The exact opposite of part (a)
- c. You want to claim that there is no difference between genders.
- d. You want to “prove” that the differences between genders exist.

Q2. Osteoporosis is a condition in which bone density decreases, often resulting in broken bones. The bone density usually peaks at the age of 30 and decreases thereafter. To understand more about the condition, researcher recruited a random sample of women aged 50 and older. Each woman’s bone density loss was recorded.

- a. Compute mean and median of these data.
- b. Comment about Skewness using (a)
- c. Compute Standard deviation, CV of the bone density losses. Comment.

Q3.1 Casino Windsor conducts surveys to determine the opinion of its customers. Among other

questions, respondents are asked to give their opinion about “Your overall opinion of Casino Windsor”. The responses are: Excellent, good, average and poor

In addition, the gender of the respondents noted. After analyzing the results, the following table of joint probabilities was produced.

Rating	Women	Men
Excellent	0.27	0.22
Good	0.14	0.10
Average	0.06	0.12
Poor	0.03	0.06

- What proportion of the customers of this casino rate it excellent?
- Determine the probability that a male customer rates casino Windsor as excellent
- Find the probability that a customer who rates Casino Windsor as excellent is a man
- Are the gender and rating independent of each other?
- Determine the probability that a customer rates casino Windsor as excellent and is women too.

Q3.2 A new automated production process has had an average of 2 breakdowns per day, Because of the cost associated with a breakdown, management is concerned about the possibility of having three or more breakdowns during a day. Assume that breakdowns occur randomly, that the probability of a breakdown is the same for any two time intervals of equal length, and that breakdowns in one period are independent of breakdowns in other periods. What is the probability of having three or more breakdowns during a day?

Q4.1 The amount of time devoted to study statistics each week by students who achieve a grade of **A** in the course is normally distributed RV with a mean of 7.5 hours and standard deviation of 2.1 hours.

- What proportion of **A** students study for more than 10 hours per week
- Find the probability that an **A** student spends between 7 to 9 hours of studying.
- What proportion of students will spend fewer than 3 hours of studying?
- What is the amount of time below which only 5% of all **A** students spend studying?

Q4.2 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?

Q5.1 Before marketing new products nationally, companies often test them on samples of potential customers. Such tests have a known reliability. For a particular product types, a test

will indicate success of the product 75% of the time if the product is indeed successful and 15% of the time when the product is not successful. From past experience with similar products, a company knows that a new product has a 0.60 chance of success on the national market. If the test indicates that the product will be successful, what is the probability that it really will be successful?

Q5.2 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 Grundig, 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 Grundig will be dumped?

Q6. Wage web conducts surveys of the salary data and present summaries on its website. Based on salary data as of October 1, 2002, Wage web reported that the average annual salary for sales Vice President was \$142,111, with an annual bonus of \$15432 (wage web.com, March 13, 2003). Assume the following data are sample of annual salary and bonus for 10 sales vice presidents. Data are in thousands of dollars.

Vice president	Salary	Bonus
1	135	12
2	115	14
3	146	16
4	167	19
5	165	22
6	176	24
7	98	7
8	136	17
9	163	18
10	119	11

- Develop a scatter plot for the data with the salary as independent variable.
- What does the scatter diagram developed in part (a) indicate about the relationship between salary and bonus?
- Provide an interpretation for the coefficient of determination.
- Predict the bonus for a VP with annual salary of \$120,000.