Time: 3 hours   **Marks: 50**   **Date ; 1st October 2019**

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)**

Q1. Is there a brand loyalty among the car owners in purchase of gasoline? To help answer the question a random sample of car owners was asked to record the brand of gasoline is their last two purchases. Use the graphical technique to formulate your answer.

Q1.2 A computer company has diversified its operations into financial services, construction, Manufacturing and operations. In a recent annual report the following table were provided. Create charts between these data so that the difference between this year and the last year is clear.

Q2 The Hawaii Visitors Bureau collects data on the number of visitors to the islands. The January.

From Europe

118.70	112.25	94.01	144.03	162.44	161.61	76.20
102.11	110.87	79.36	129.04	95.16	114.16	121.88

From Asia:

19.89	41.13	40.67	40.41	43.07	24.86
31.61	21.60	27.34	64.57	32.98	41.31

a. Compute the standard deviation, and the coefficient of variation for the two sources of visitors.
b What comparisons can you make between the numbers of visitors from the two sources?
C can this information be used in promotion of the this island. Discuss the implication of the information collected

Q3 To gauge the relationship between education and unemployment, an economist turned to the US Census, from which the following table of the joint probabilities was produced:

	Employed	Unemployed
<High school	0.091	0.008
High school	0.282	0.014
Some college	0.166	0.007

Associate's	0.095	0.003
Bachelor's	0.213	0.004
Advanced	0.115	0.002

- What is the probability that a high school graduate is unemployed

- Determine the probability that a randomly selected graduate is employed

- Find the probability that an unemployed person possess advance degree

- What is the probability that randomly selected individual did not finish the high school

- Is the educational qualification and the unemployment can be considered as independent events

- Why marginal probability is called as marginal probability?

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 9.5 hours and standard deviation of 2.1 hours.

- What proportion of **A** students study for more than 9hours 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 2.5% 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 65% 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 Grunding, had to be made. The decision required a simple majority of nine decision-making shareholders. If each is believed to have a 0.35 probability of voting yes on the issue, what is the probability that Grunding will be dumped?

Q6. Wage web conducts surveys of the salary data and present summaries on its website. Based on salary data as of November 1, 2012, 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, 2013). 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	11
2	115	12
3	146	16
4	167	19
5	165	22
6	176	24
7	98	7
8	136	17
9	163	18
10	119	15

- 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.