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Daffodil International University
Department of Computer Science and Engineering
Faculty of Science and Information Technology (FSIT)
Final Examination, Semester: Summer-2019
Course Code: STA133 Course Title: Statistics and Probability
Total Marks: 40 Time: 90 minutes Course Teacher: ALL

Answer any three (03) of the following questions including question #1

1 a. The success of a shopping center can be represented as a function of the distance (in miles) from the center of the population and the number of clients (in hundreds of people) who will visit. The data is given in the table below

No. of Customer	8	7	6	4	2	1
Distance	15	19	25	23	34	40

i. Determine coefficient of determination and interpret the result. 3
ii. Construct the estimated regression model and explain the regression parameters. 3
iii. Calculate expected no. of customer when distance is 23. 1
iv. Draw and explain scatter diagram as well as regression line based on above data. 3

b. From a survey involving 1000 people in a certain city, it was found that 500 people had tried a certain brand of diet cola, 600 had tried a certain brand of regular cola, and 100 had **NOT** tried any types of cola. (i) Draw venn diagram. If a resident of the city is selected at random. What is the probability that the resident has tried (ii) Diet cola but not regular cola? (iii) Only one cola? (iv) At least one type of cola? 1×4

(v) It is known that the resident has tried diet cola, what is the probability that the resident has tried regular cola? 2

c. Advertising expenses are a significant component of the cost of goods sold. Listed below is a frequency distribution showing the advertising expenditures 74 software manufacturing companies located in the USA. Calculate coefficient of skewness and interpret it 4

Number of Companies	5	4	14	17	9	6	12	7

d. The index number of prices of cotton and coal shares in 2019 were under- 4

Cotton	88	78	73	64
Coal	31	30	30	29

Which of the share you consider more consistent?

2 a. The total automobile sales (millions of dollars) in the United States for the last 10 years are listed below. 3

7, 17, 22, 12, 25, 30, 19, 10, 28, 23

Compute the 3rd quartile (Q_3), 2nd deciles (D_2) and 89th percentiles (P_{89}).

b. The speed with which utility companies can resolve problems is very important. GTC, the Georgetown Telephone Company, reports it can resolve customer problems the same day they are reported in 70 percent of the cases. Suppose the 15 cases reported today are representative of all complaints. 5

i. How many of the problems would you expect to be resolved today? What is the standard deviation?
ii. What is the probability 10 of the problems can be resolved today?
iii. What is the probability 10 or 11 of the problems can be resolved today?

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iv. What is the probability more than 10 of the problems can be resolved today?

3 **a.** A study by the National Park Service revealed that 50 percent of vacationers going to the Rocky Mountain region visit Yellowstone Park, 40 percent visit the Tetons, and 35 percent visit both.

i. Are the events mutually exclusive or not? Explain. 1

ii. What is the probability a vacationer will visit at least one of these attractions? 2

b. (i) What are the difference between correlation and regression? 2

(ii) What are the relation between correlation and regression? 1

(ii) Explain the laws of probability. 2

4 **a.** Define sample space. A coin throws four times. Write down the sample space. 1+2

b. An internal study by the Technology Services department at Lahey Electronics revealed Company employees receive an average of two emails per hour. Assume the arrival of these emails is approximated by the Poisson distribution.

i. What is the probability Linda Lahey, company president, received exactly 1 email between 4 P.M. and 5 P.M. yesterday? 1

ii. What is the probability she received at least 1 email during the period? 1

iii. What is the probability she did not receive any emails during the period? 1

iv. What is the probability she received 5 or more emails during the period? 2