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Daffodil International University

Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Fall 2025
Course Code: STA 101; Course Title: Statistics I
Sections & Teachers: TBN, TK, MSAM (43_ALL)

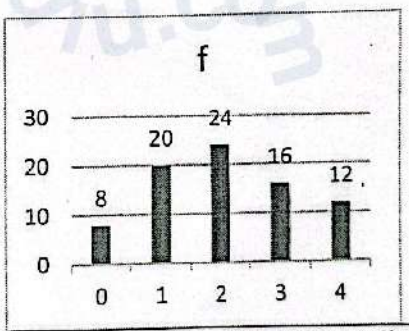
Time: 2:00 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.		The following data represent the values of rainfall (mm) and temperature (°C) to study the relationship that rainfall and temperature are related: Rainfall (mm) 5.5 6.8 7.0 4.2 2.3 8.0 9.0 4.5 Temperature (°C) 32.5 31.0 30.0 33.5 34.2 32.0 30.0 34.0		**CLOs**
	a)	**Determine** whether the relationship between Rainfall and Temperature be positively or negatively related using correlation coefficient?	**[Marks-2]**	**CLO-2** *Level-3*
	b)	**Construct** the estimated regression equation and interpret your findings.	**[Marks-3]**	
2.	*a)*	Suppose that the average number of hours a household personal computer is used for entertainment is two hours per day. Assume the times for entertainment are normally distributed and the standard deviation for the times is half an hour. i. **Determine** the probability that a household personal computer is used for entertainment more than 2.75 hours per day. ii. **Calculate** the probability that a household personal computer is used for entertainment between 1.8 and 2.75 hours per day.	**[Marks-5]**	
	b)	A statistics instructor believes that the average number of College students attended the opening midnight showing of the latest Harry Potter movie is fewer than 20. She surveys 84 of her students and finds that on an average 11 of them attended the midnight showing with a variation of 3.2. **Investigate** whether the instructor's belief is true at the 0.05 significance level. (The critical values being ±1.645 for (α=0.05), ±2.33 for (α=0.01), and ±1.28 for (α =0.10)	**[Marks-5]**	**CLO-3** *Level-3*
	c)	Previously, an organization reported that teenagers spent 4.5 hours per week, on average, on the phone. The organization thinks that, currently, the mean is higher. Thirty randomly chosen teenagers were asked how many hours per week they spend on the phone. The sample mean was 4.75 hours with a sample standard deviation of 2.0. **Investigate** whether the organization's previous report is true at the 0.10 significance level. (The critical values being ±1.645 for (α=0.05), ±2.33 for (α=0.01), and ±1.28 for (α =0.10)	**[Marks-5]**	

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3.	a)	500 graduates are selected from a university where 380 of them are males and 120 of them are females. After publication of the result, a survey on those graduates is conducted and found that 304 male graduates and 96 female graduates are assured a job. i. **Identify** a contingency table that shows graduates according to their job status. ii. **Identify** the probability that, a graduate is a female or assured a job? iii. **Identify** the probability that, a selected graduate is a male and not assured a job? iv. **Figure out** the probability that a selected graduate is a male given that he does not assured a job. v. **Figure out** whether the events "graduate is a Female" and "Graduate assured a job" mutually exclusive?	**[Marks-10]**	**CLO-4** *Level-4*
	b)	Let x be the number of systems installed on a given day at a shop. The following bar graph shows the frequency distribution of x for the past 80 days. i. **Construct** a probability distribution function (PDF) for X and check whether the PDF satisfies the two characteristics a PDF. ii. **Calculate** the Mean and Standard deviation of X. 	**[Marks-5]**	
	c)	A manufacturing plant inspects items coming off an assembly line. Based on past quality control data, the probability that an item passes inspection is 0.9. A supervisor randomly selects 10 items for inspection. i. **Investigate** is the probability that at least 3 items pass inspection? ii. **Investigate** the mean and variance of the number of items that pass inspection.	**[Marks-5]**	