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Daffodil International University

Faculty of Science & Information Technology
Department of Software Engineering
Final Examination, Fall 2024
Course Code: STA 101; Course Title: Statistics I
Sections & Teachers: 41_A-41_G (AS1), 41_H-41_N (AMN) **Marks: 40**
Time: 2:00 Hrs.

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.]

			Marks	
1.	A software company is analyzing the distribution of the time (in hours) taken by 10 developers to complete a coding task as follows: **Time Taken (in hours): 4.5, 5.0, 4.0, 6.0, 5.5, 7.0, 6.5, 5.5, 8.0, 4.0.** It is noted that the company has only 10 developers.			CLO-2 Level-3
	a)	**Measure** the shape of the distribution by calculating skewness of the data.	3	
	b)	If the 1st, 3rd and 4th central moments are 0, 193 and 1254.67 respectively from the above example. **Compute** kurtosis and comment.	2	
2.	A software engineering team tracks the following data during a project: **Lines of Code (LOC)**: 10, 22, 28, 36, 42, 46, 55 **Number of Defects**: 4, 7, 9, 13, 14, 17, 21			CLO-3 Level-3
	a)	**Calculate** the correlation coefficient to determine the strength and direction of the relationship between LOC and the number of defects.	4+1	
	b)	**Construct** a simple linear regression model of the form $\hat{Y}_t = \beta_0 + \beta_1 X_t$ for the data. Also interpret the parameters of the fitted model for the data.	4+1	
	c)	Using the regression equation, **predict** the number of defects if the LOC is 80.	1	
	d)	**Determine** the error for single value when the lines of code are 22.	2	
	e)	**Prepare** the co-efficient of Determination for the fitted model.	2	
3.	*a)*	A team tracks the following probabilities during their debugging process: Event A: A bug is fixed within the first 2 hours of debugging and P(A)=0.39; Event B: A bug requires less than 5 lines of code to fix and P(B)=0.53. The joint probability that a bug is fixed within the first 2 hours and requires less than 5 lines of code is $P(A \cap B) = 0.40$. **Detect** the probabilities: i) that a bug either gets fixed within 2 hours or requires less than 5 lines of code to fix. ii) If a bug is fixed within the first 2 hours, **Illustrate** the probability that it requires less than 5 lines of code to fix? iii) Are the events "fixed within 2 hours" and "requires less than 5 lines of code" independent? **Explain** your answer.	5	CLO-4 Level-4

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