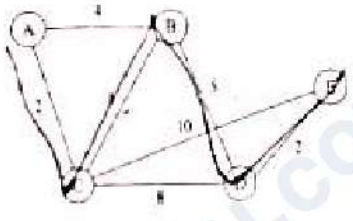
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Daffodil International University

Faculty of Science & Information Technology
Department of Computing and Information System
Final Examination, Summer-2026
Course Code: BI334, Course Title: Data Analysis and Business Modeling
Level: 4 Term: 1

Time: 2 Hours **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.	a)	Define the following terms, giving one relevant example for each: (i) Data (ii) Big Data (iii) Structured Data (iv) Unstructured Data (v) Metadata	[5]	CO1
	b)	(i) Explain, with suitable business examples, the difference between descriptive statistics and inferential statistics. (ii) What is the difference between a discrete variable and a continuous variable? Give one example of each.	[5]	
2.	a)	ABC Furniture Ltd manufactures tables and chairs. Each table requires 4 hours of carpentry and 2 hours of painting, each Chair requires 3 hours of carpentry and 1 hour of painting. The factory has 120 hours of carpentry time and 50 hours of painting time available per week. Profit is Tk. 1000 per Table and Tk. 600 per Chair. Formulate this problem as a Linear Programming (LP) model, defining the decision variables, the objective function, and all constraints.	[5]	CO2
	b)	Solve the LP model formulated in above question [2(a)] using the Graphical Method. Plot the feasible region, identify the corner points, and determine the number of tables and chairs the factory should produce per week to maximize profit. State the maximum weekly profit.	[5]	
3.	a)	The figure below shows the direct road connections and distances (in km) among five cities:  Using the network modeling concepts, find the shortest path from City A to City E, showing your calculation.	[5]	CO3

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	b)	A supermarket recorded the following monthly sales (Tk. in thousand): Jan=140, Feb=150, Mar=145, Apr=160, May=175, Jun=170, Jul=185, Aug=195 (i) Compute the 3-month (3-point) Moving Average for this data. (ii) Based on the pattern observed; identify which component(s) of a time series, Trend, Seasonal, Cyclical, or Random, are most evident in this dataset, and justify your answer.	[5]	
4.	a)	A retail chain is planning its inventory for the next year using a time-series forecasting model developed from five years of historical sales data. Evaluate the strengths and limitations of using this approach for long-term inventory planning. Would you recommend any alternative or complementary forecasting approach for the company? Justify your recommendation with appropriate reasoning.	[5]	CO4
	b)	A company uses an AI-assisted predictive model, trained on historical hiring records, to shortlist job candidates. It is later discovered that the historical data reflects past gender bias in hiring decisions. Evaluate the organizational and ethical implications of continuing to use this model, and recommend at least two safeguards the company should adopt to ensure fair and responsible use of AI-assisted decision models.	[5]	

Best Luck