



# Daffodil International University

Department of Business Administration

Faculty of Business & Entrepreneurship

Final Examination, Spring-2026

Course Code: 0613-324, Course Title: Artificial Intelligence in Business Applications

Batch: 65

Teacher: TR/Jakia/Sagor/Sagor/Sagor/Sagor

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.	<p>a) <b>Describe</b> how Artificial Intelligence (AI) acts as a "smart assistant" in business transformation, specifically highlighting its role in improving "Customer Experience (CX)" with real-world examples like Amazon. (6 Marks)</p> <p>b) <b>Explain</b> the difference between Supervised and Unsupervised Learning based on the presence of "labeled data". Provide one business use case for each (e.g., Fraud detection vs. Customer segmentation). (4 Marks)</p>	6+4	CLO1
2.	<p>a) <b>Apply</b> the K-Nearest Neighbors (KNN) algorithm to find the distance between two customer data points in a 2D space: Point A (3, 5) and Point B (7, 8). (5 Marks)</p> <ul style="list-style-type: none"><li>• Calculate the Euclidean Distance.</li><li>• Calculate the Manhattan Distance.</li></ul> <p>b) <b>Illustrate</b> the step-by-step process of how a Decision Tree works, starting from the "Root Node" to the "Leaf Nodes". Use a "Loan Approval" scenario (features: Income, Credit Score) as your example. (5 Marks)</p>	5+5	CLO3

3.	<p>a) <b>Describe</b> a Customer Churn Prediction using the Logistic Regression formula <math>z = B_0 + B_1X</math>.</p> <p>Scenario: A bank uses "Number of Complaints" (X) to predict churn.</p> <ul style="list-style-type: none"> <li>Given: Constant (<math>B_0</math>) = -1.5, Coefficient (<math>B_1</math>) = 0.6, and a customer has 4 complaints.</li> <li>Task: Calculate the value of z and apply the Sigmoid function <math>P(y=1)</math> to find the probability of churn (Use <math>e^{0.9} = 2.46</math>). (5 Marks)</li> </ul> <p>b) Based on your calculation in (a), if the Decision Rule is <math>P \geq 0.5</math>, will this customer leave the bank? Discuss how Logistic Regression differs from Linear Regression in terms of the "type of outcome" it predicts. (5 Marks)</p>	5+5	CLO2
4.	<p>a) <b>Solve</b> the following transaction dataset and calculate the <b>Support</b> for the item-set {Bread, Milk}.</p> <ul style="list-style-type: none"> <li>T1: Bread, Milk, Butter</li> <li>T2: Bread, Butter</li> <li>T3: Milk, Eggs</li> <li>T4: Bread, Milk</li> <li>T5: Bread, Milk, Eggs (Total Transactions = 5) (4 Marks)</li> </ul> <p>b) <b>Construct</b> the Confidence for the Association Rule: {Milk} <math>\rightarrow</math> {Bread} using the dataset above. (4 Marks)</p> <p>c) If the Minimum Confidence Threshold is 75%, <b>compute</b> whether the rule {Milk} <math>\rightarrow</math> {Bread} is a "Strong Rule". Suggest how a grocery store could use this rule for "Store Layout Planning". (2 Marks)</p>	4+4 +2	CLO3