Daffodil International University

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Examination, Fall-2023
Course Code: CSE321, Course Title: Data Mining and Machine Learning
Level: 3 Term: 2 Batch: 58 and 59
Time: 2 Hours **Marks: 40**

Answer ALL Questions [Optional]

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

1. **Apply** Algorithms for the following dataset is used to predict whether an animal is a pet or not and **compare** the performances. **CO3 [15]**

ID	Animals	Size of Animal	Body Color	Can we pet them
0	Dog	Medium	Black	Yes
1	Dog	Big	White	No
2	Rat	Small	White	Yes
3	Cow	Big	White	Yes
4	Cow	Small	Brown	No
5	Cow	Big	Black	Yes
6	Rat	Big	Brown	No
7	Dog	Small	Brown	Yes
8	Dog	Medium	Brown	Yes
9	Cow	Medium	White	N o
10	Dog	Small	Black	Yes
11	Rat	Medium	Black	No
12	Rat	Small	Brown	No
13	Cow	Big	White	Yes

If we consider the following test data, test = (Cow, Medium, Black). What it will predict?

2. A market basket transactions data is shown in Table 1 where we have 10 transactions of different computer products and need to find out the frequent item sets from the following table. Then, find the confidence of the generated rules based on the support=60% and confidence=60%. **CO4 [15]**

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Table 1. Market basket transactions

Transaction ID	Items Bought
1	{Laptop, Printer, Tablet, Headset}
2	{Printer, Monitor, Tablet}
3	{Laptop, Printer, Tablet, Headset}
4	{Laptop, Monitor, Tablet, Headset}
5	{Printer, Monitor, Tablet, Headset}
6	{Printer, Tablet, Headset}
7	{Monitor, Tablet}
8	{Laptop, Printer, Monitor}
9	{Laptop, Tablet, Headset}
10	{Printer, Tablet}

3. An artificial neural network has been trained on a binary classification dataset where the independent attributes are Temperature and Humidity, whose target variables are Sunny and Overcast, encoded as 0 and 1, respectively, before training the network. In this network, the hidden nodes are activated using Rectified Linear Units (ReLU), and the last node is activated using Sigmoid. The trained network is shown below. Classify the data shown in Table 1 using this network. **CO4 [10]**

Table 1: Test Data

Temperature	Humidity
1.05	1.8
2.3	1.5