Bangladesh University

Department of CSE
Mid Term Examination, Summer 2026 Semester
Course Title: Pattern Recognition
Course Code: CSE-3301
Batch: 69th B (Evening)

Time: 1.5 hours Total Marks: 4×5 = 20

Instructions: *1. **Answer any 4(total) out of the 5 questions.***
2. Read the questions carefully and answer accordingly.
3. If you have problem in understanding any question, ask your teacher; not your Classmates.

1. a). Define *Pattern Recognition*. Explain the basic components of a pattern recognition system with a neat diagram. (3)

   b). Mention two real-life applications of pattern recognition. (2)

2. a) Define machine learning and explain its significance in today's technological landscape, including an example of its application in a specific industry. (3)

   b) Differentiate among the following machine learning approaches with suitable examples: (2)

   i) Supervised Learning
   ii) Unsupervised Learning

3. a) In a pattern recognition task, the feature values of an object are given as: (3)

   X = [7.4, 3.2, 5.8, 4.1, 6.5, 2.9, 5.0]

   Calculate the **median** feature value. Show all the necessary steps, including arranging the values in ascending order before finding the median.

   b). List the significant differences between Machine learning algorithms and Deep Learning. (2)

4.

Area(Square feet)	Price(1000$)
2100	350
1522	250
1566	270
2700	400
1300	300

Mr. X, a distinguished Professor at BU and one of the world's leading researchers, provides his students with above data to develop a model that predicts Price ($) based on Area (square feet) as input.

a). Mention the suitable model for the task of Mr. X and how can you develop the model by the given data. (4)

b) List down some of the metrics used to evaluate the Model which you mention in question a (1)

with the mathematical equations.

5.

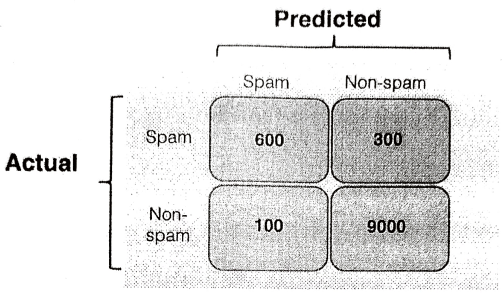


Figure a: Confusion Matrix

a). Calculate the following metrics based on figure a: (5)

i) True Positives (TP), True Negatives (TN), False Positives (FP), False Negatives (FN)
ii) Accuracy
iii) Precision
iv) Recall (Sensitivity)
v) F1 Score