COMSATS UNIVERSITY ISLAMABAD
DEPARTMENT OF COMPUTER SCIENCE
Mid Term Examination, Fall 2023

Class/Section: - BSAI – 5A / BDS 6A
Subject: - Machine Learning Fundamentals (AIC 354)
Instructor: - Dr. Muhammad Usman Yaseen

Marks: - 25
Time: - 80 minutes
Dated: - Nov 09, 2023

----------CLO -1----------

Explain learning paradigms along with task and applications.

(5 marks)

Q# 01: - Answer the following questions.

You have developed a machine learning model for a binary classification problem, and the model's performance has been evaluated using a confusion matrix as given below:

	Predicted Labels	
	Class A	Class B
Actual Labels		
Class A	80	20
Class B	15	85

i) How many True Positive (TP) and False Positive (FP) are there? Explain why?

ii) How many True Negative (TN) and False Negative (FN) are there? Explain why?

iii) Calculate the accuracy based on the given confusion matrix.

iv) Calculate the precision based on the given confusion matrix.

v) Calculate the recall based on the given confusion matrix.

(5 marks)

Q# 02: - Case Study:

Suppose a company wants to build a predictive model to identify potential customers likely to purchase their product. The company has a dataset containing customer information, including their age, gender, income, education, and previous purchases. The goal is to build a model that can accurately predict whether a customer is likely to make a purchase or not.

In this case study, explain how the company can use different learning paradigms to build the predictive model? Please use all the machine learning paradigms and justify the selection of each paradigm.

----------CLO 2----------

Apply supervised learning techniques to solve classification problems.

(5 marks)

 # 03: -

hat is the role of support vectors in SVM? How SVM can be used for non-linearly separable datasets? Also plain, why the maximum margin hyperplane is considered to be most suitable in SVM for classification.