H.T.No. | | | | | | | | | | |

Code No: CT3546 **SRGEC-R20**

III B.Tech II Semester Supplementary Examinations, January 2024

MACHINE LEARNING

(Artificial Intelligence and Data Science)

Time: 3 Hours **Max. Marks: 70**

Note: Answer one question from each unit.
All questions carry equal marks.

5 × 14 = 70M

UNIT-I

1. a) How data is represented in machine learning algorithms? Give suitable example. (6M)

   b) What are the different types of learning? Explain them with a sample application in each area. (8M)

(OR)

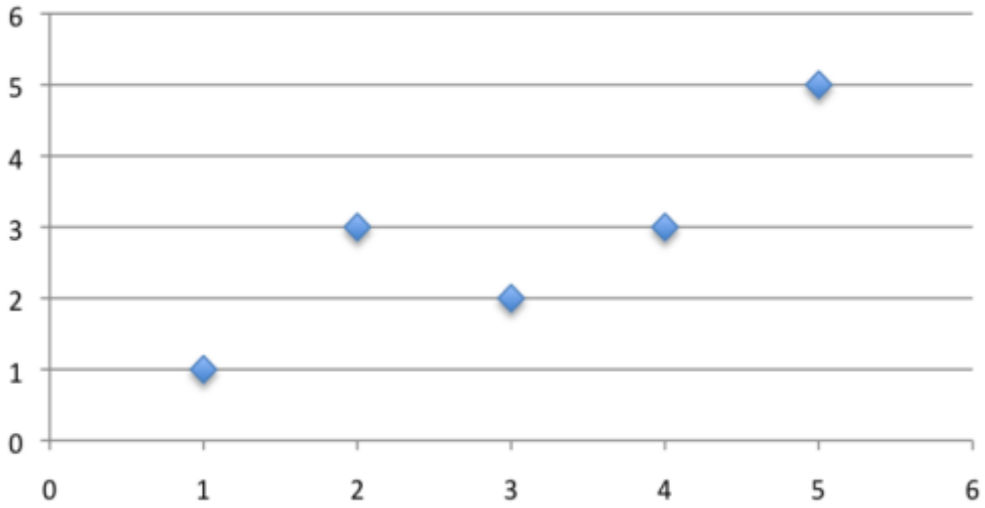
2. a) Is domain knowledge required for the productive use of machine learning? If yes justify your answer. (7M)

   b) Why a classification and regression problems comes under supervised learning? Give your justification. (7M)

UNIT-II

3. a) Why k-nearest neighbor classifier is called as a lazy learner? Explain. (6M)

   b) Consider the following data points whose coordinates are given as (x,y) as given below. Find the best fit line that fits these points using linear regression. (8M)



(OR)

4. a) What is Naïve Bayes classifier? Why is it named so? Illustrate Naïve Bayes classifier with a suitable example. (7M)

   b) Write the significance role of statistical analysis in machine learning. (7M)

UNIT-III

5. a) Discuss how information gain measure is used in deciding the splitting attribute during the construction of the decision tree. (6M)

   b) Describe the significance of Kernal functions in SVM. List and explain any three kernel functions. (8M)

(OR)

6. Construct the decision tree using ID3 algorithm for the concept Play-Golf using the database given below. Also predict the class label of the unknown data X given below using the decision tree constructed. (14M)

Outlook	Temp	Humidity	Windy	Play-Golf
Rainy	Hot	High	FALSE	No
Rainy	Hot	High	TRUE	No
Overcast	Hot	High	FALSE	Yes
Sunny	Mild	High	FALSE	Yes
Sunny	Cool	Normal	FALSE	Yes
Sunny	Cool	Normal	TRUE	No
Overcast	Cool	Normal	TRUE	Yes
Rainy	Mild	High	FALSE	No
Rainy	Cool	Normal	FALSE	Yes
Sunny	Mild	Normal	FALSE	Yes
Rainy	Mild	Normal	TRUE	Yes
Overcast	Mild	High	TRUE	Yes
Overcast	Hot	Normal	FALSE	Yes
Sunny	Mild	High	TRUE	No

UNIT-IV

7. Apply K Means clustering to cluster the following data into two groups. Assume cluster centroid are m1=2 and m2=4. The distance function used is Euclidean distance. { 2, 4, 10, 12, 3, 20, 30, 11, 25 } (14M)

(OR)

8. What is clustering? Briefly explain different types of clustering methods. (14M)

UNIT-V

9. a) State the limitation of perceptron training rule. How to overcome this using delta rule? Explain. (7M)

   b) Model a two layer network of perceptrons that implements A XOR B. (7M)

(OR)

10. a) Discuss the applications of Artificial Neural Network used in various fields. (7M)

    b) Explain the steps involved in the Delta Rule[widrow& Hoff learning rule]. (7M)

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