School of Computing Science and Engineering
B.Tech CSE
ETE - Jun 2023

Time : 3 Hours   **Marks : 50**

Sem II - MCAE2412 - Machine Learning
Your answer should be specific to the question asked
Draw neat labeled diagrams wherever necessary

1.	What is the difference between supervised learning and reinforcement learning?	K3 CO2 (2)
2.	List any four applications of Random forest.	K4 CO2 (2)
3.	Why do we use the Find S algorithm?	K4 CO1 (2)
4.	What is Bagging? Gives all steps of Bagging algorithm.	K2 CO1 (2)
5.	Compare the computer with Neural Networks.	K1 CO1 (2)
6.	Compare K-means and KNN Algorithms.	K6 CO4 (6)
7.	Descries the concept of Decision Tree Learning. How Decision Tree is represented? Explain the problem of overfitting in Decision Tree.	K4 CO3 (5)
8.	Explain the function of perceptron? And why do we need Weights and Bias?	K3 CO3 (5)
9.	Solve the following question	K5 CO4 (8)

Let X be a continuous random variable with the following PDF:

$$f_X(x) = \begin{cases} 2x & \text{if } 0 \le x \le 1 \\ 0 & \text{otherwise} \end{cases}$$

Also, suppose that

$$Y \mid X = x \quad \sim \quad Geometric(x).$$

Find the MAP estimate of X given $Y = 3$.

10.	Discuss the multiple linear regression (MLR). Write the mathematical formulation of MLR. Give Python instruction of MLR model creation and fit the model with training date set.	K5 CO6 (8)
11.	What is Temporal-Difference (TD) learning? Explain update rules of TD learning and TD(0) algorithms.	K4 CO3 (8)