Printed Pages: 01 **Sub Code: KCS-055**

Paper Id: | 2 | 3 | 2 | 1 | 1 | 9 | **Roll No.** | | | | | | | | | | | | |

B. Tech.
(SEM V) THEORY EXAMINATION 2022-23
MACHINE LEARNING TECHNIQUES

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2*10 = 20

(a) Discuss model representation of artificial neuron.

(b) Explain general to specific ordering hypothesis in concept learning.

(c) Discuss support vectors in SVM.

(d) Compare Artificial Intelligence and Machine Learning.

(e) Discuss reinforcement learning.

(f) Illustrate the advantages of instance-based learning techniques over other machine learning techniques.

(g) Differentiate between Gradient Descent and Stochastic Gradient Descent.

(h) Compare ANN and Bayesian network.

(i) Illustrate Markov decision model.

(j) Differentiate between Q learning and Deep Learning.

SECTION B

2. Attempt any *three* of the following: 10*3 = 30

(a) Explain supervised and unsupervised learning techniques.

(b) Discuss linear regression and logistic regression in detail.

(c) Describe the following concepts in decision tree in detail:
(i) Avoiding overfitting in decision tree. (ii) Incorporating continuous valued attributes.

(d) Explain various types of activation functions with examples.

(e) Illustrate the process of Q-learning and discuss the following terms:
(i) Q-values or action value (ii) Rewards and Episode (iii) Temporal difference or TD update.

SECTION C

3. Attempt any *one* part of the following: 10*1 = 10

(a) Illustrate the various areas in which you can apply machine learning.

(b) Compare regression, classification and clustering in machine learning along with suitable real-life applications.

4. Attempt any *one* part of the following: 10 *1 = 10

(a) Discuss the role of Bayes theorem in machine learning. How naive Bayes algorithm is different from Bayes theorem?

(b) Explain hyperplane (decision boundary) in SVM. Categorize various popular kernels associated with SVM.

5. Attempt any *one* part of the following: 10*1 = 10

(a) Demonstrate K-Nearest Neighbors algorithm for classification with the help of an example.

(b) Explain Instance based learning. Compare locally weighted regression and radial basis function networks.

6. Attempt any *one* part of the following: 10*1 = 10

(a) Explain the different layers used in convolutional neural network with suitable examples.

(b) Illustrate backpropagation algorithm by assuming the training rules for output unit weights and Hidden Unit weights.

7. Attempt any *one* part of the following: 10*1 = 10

(a) Explain various types of reinforcement learning techniques with suitable examples.

(b) How to Identify the reproduction cycle of genetic algorithm? Explain with suitable example.