Printed Pages: 02 **Sub Code: KOE-073**

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B. TECH.
(SEM VII) THEORY EXAMINATION 2022-23
MACHINE LEARNING

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. **2x10 = 20**

(a) Define Machine learning and its application.

(b) What do you mean by big data analysis

(c) Define Binary Decision Tree

(d) Discuss the weight and bias in ANN

(e) How do you evaluate hypothesis?

(f) What is Bayes Theorem?

(g) What is finite and infinite hypothesis space?

(h) What is PAC learning model in machine learning?

(i) What is the meaning of Chromosome in genetic algorithm?

(j) What is the difference between reinforcement learning and Artificial Intelligence?

SECTION B

2. Attempt any *three* of the following: **10x3 = 30**

(a) What are the five limitations of machine learning? Explain with suitable example.

(b) Define the following in decision tree algorithm:

(i) Entropy, (ii) Information gain,

(iii) Gini index, (iv) Gain Ratio,

(iv) Chi-Square

(c) What is Naive Bayes classifier and how does it work? Explain the advantages of Naive Bayes algorithm.

(d) What is the advantages & disadvantages of locally weighted regression? Explain with suitable example.

(e) Explain the main steps of genetic algorithm with suitable examples?

SECTION C

3. Attempt any *one* part of the following: **10x1 = 10**

(a) Explain the difference between Find-S and candidate elimination algorithm?

(b) What is the inductive bias in CNN? Explain the image identification with CNN.

4. Attempt any *one* part of the following: 10 x1 = 10

(a) What is the difference between forward propagation and backward propagation in neural networks explain weight calculation for forward pass network?

(b) Explain the steps of decision tree making, with following data set, also calculate the Calculate data set entropy and information gain.

DAY	Outlook	Temperature	Humidity	Sun light	Play cricket
D1	Rainy	Hot	High	Weak	No
D2	Rainy	Hot	High	strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Sunny	Mild	High	Weak	Yes
D5	Sunny	Cool	Normal	Weak	Yes

5. Attempt any *one* part of the following: 10x1 = 10

(a) Show the following data set through Naive Bayes Classifiers:

(i) If the weather is sunny, then the Player should play or not?

(ii) If the level of humidity is medium & spend of the wind is high and then then the plays should play or not?

Case	Outlook	Temperature	Humidity	Windy	Play Golf
0	Rainy	Hot	High	FALSE	No
1	Rainy	Hot	High	TRUE	No
2	Overcast	Hot	High	FALSE	Yes
3	Sunny	Mild	High	FALSE	Yes
4	Sunny	Cool	Normal	FALSE	Yes
5	Sunny	Cool	Normal	TRUE	No
6	Overcast	Cool	Normal	TRUE	Yes
7	Rainy	Mild	High	FALSE	No
8	Rainy	Cool	Normal	FALSE	Yes
9	Sunny	Mild	Normal	FALSE	Yes
10	Rainy	Mild	Normal	TRUE	Yes
11	Overcast	Mild	High	TRUE	Yes
12	Overcast	Hot	Normal	FALSE	Yes
13	Sunny	Mild	High	TRUE	No

(b) Draw the cluster of following 8 points into 3 clusters:

A1=(5,10), A2=(4,6), A3=(9,4), A4=(5,8), A5=(7,5), A6=(7,4), A7=(3,2), A8=(4,9).

Use the k-means algorithm and Euclidean distance and take the Initial cluster centers are A2(4, 6), A4(5, 8) & A8 (4,9). The solution up to two iterations.

6. Attempt any *one* part of the following: 10x1 = 10

(a) Show the application of Clustering in various sectors, discus with following examples: Marketing, Insurance, & Earth-quake studies.

(b) Show the application of supervised machine learning, explain with suitable example.

7. Attempt any *one* part of the following: 10x1 = 10

(a) What are the 4 types of reinforcement? Explain any two.

(b) Is reinforcement learning Artificial intelligence or Machine Learning? also explain the data mining in ML.