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SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

III/IV B.Tech. DEGREE EXAMINATION, MAY - 2023

Sixth Semester

INFORMATION TECHNOLOGY

20IT6302 MACHINE LEARNING

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

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1.	a.	Name the performance evaluation metrics for a classification model.	**(CO1 K1)**
	b.	Compare classification and regression models.	**(CO1 K2)**
	c.	List the issues in decision trees.	**(CO2 K1)**
	d.	How to handle non-linear data in SVM?	**(CO2 K1)**
	e.	What is the purpose of clustering?	**(CO3 K1)**
	f.	What is the principle of Bayes theorem?	**(CO3 K1)**
	g.	Give an example for hierarchical clustering.	**(CO3 K1)**
	h.	List the activation functions used in neural networks.	**(CO4 K1)**
	i.	List the applications of reinforcement techniques.	**(CO4 K1)**
	j.	Relate machine learning and deep learning.	**(CO4 K2)**

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PART-B

4 x 15 = 60M

UNIT-I

2. a. Explain about supervised and unsupervised learning techniques with a suitable example. **(CO1 K2) 9M**

   b. Compare and contrast binary and multi-class classification models. **(CO1 K2) 6M**

(or)

3. a. Outline any three machine learning models with its applications. **(CO1 K2) 9M**

   b. Illustrate the linear regression? How is it useful? **(CO1 K2) 6M**

UNIT-II

4. a. Explain about support vector machines. **(CO2 K2) 7M**

   b. Summarize the multivariate linear regression model with an example. **(CO2 K2) 8M**

(or)

5. a. Explain about various SVM kernels and which one is most suitable for real time applications. **(CO2 K2) 5M**

   b. Construct the decision tree for the following weather dataset and predict the class label if "Outlook = Sunny, Temperature = Hot, Humidity = Normal, Windy = True". **(CO2 K3) 10M**

	Outlook	Temperature	Humidity	Windy	Play Game
1	Rainy	Hot	High	False	No
2	Rainy	Hot	High	True	No
3	Overcast	Hot	High	False	Yes
4	Sunny	Mild	High	False	Yes
5	Sunny	Cool	Normal	False	Yes
6	Sunny	Cool	Normal	True	No
7	Overcast	Cool	Normal	True	Yes
8	Rainy	Mild	High	False	No
9	Rainy	Cool	Normal	False	Yes
10	Sunny	Mild	Normal	False	Yes

UNIT-III

6. a. Identify and summarize the various ways of measuring distances. **(CO3 K2) 7M**

   b. Explain about Bayesian belief networks. **(CO3 K2) 8M**

(or)

7. a. Explain about Naïve Bayes classifier and list the applications of it. **(CO3 K2) 7M**

   b. Illustrate about distance based clustering. **(CO3 K2) 8M**

UNIT-IV

8. a. Briefly discuss about back propagation algorithm. **(CO4 K2) 6M**

   b. Design Back propagation using Multi-Layer Perception which has three layers like the input layer has 4 neurons, the hidden layer has 2 neurons and the output layer has a single neuron. Train the MLP by updating the weights and biases in the network. Learning rate: =0.8. **(CO4 K3) 9M**

(or)

9. a. Explain in detail about structure of a neural network.

(CO4 K2) 7M

b. Demonstrate the Q-Learning algorithm with a suitable example.

(CO4 K2) 8M

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