CBCS SCHEME

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18SCS31

Third Semester M.Tech. Degree Examination, Jan./Feb.2021
Machine Learning Techniques

Time: 3 hrs. Max. Marks: 100

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Explain the steps in designing a learning system. **(10 Marks)**

b. Describe the find-S algorithm. Explain its working by taking the enjoy sport concept and training instances below.

Example	Sky	Air Temperature	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

(10 Marks)

OR

2 a. Write candidate elimination algorithm. Apply the algorithm to obtain the final version space for the training example given above in question number 1 (b). **(10 Marks)**

b. What is machine learning? Explain different perspectives and issues in machine learning. **(10 Marks)**

Module-2

3 a. Explain the concept of decesion tree learning. Discuss the necessary measure required to select the attributes for building a decision tree using ID3 algorithm. **(10 Marks)**

b. Discuss the issues in avoiding overfitting the data, handling continuous data and missing values in decision trees. **(10 Marks)**

OR

4 a. What is a decision tree? Discuss the use of decision tree for classification purpose with example. **(10 Marks)**

b. Construct decision tree for the following dataset.

Example	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy Sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes
5	Sunny	Warm	Normal	Weak	Warm	Same	No

(10 Marks)

Module-3

5 a. Draw the perceptron network with the notation. Derive an equation of gradient descent rule to minimize the error. **(10 Marks)**

b. Describe multilayer Neural Network, expalin why buck propagation algorithm is required. **(10 Marks)**

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OR

6 a. Write the back propagation algorithm which uses stocastic gradient descent method. What is the effort of adding momentum to the network. **(10 Marks)**

b. Explain appropriate problems for Neural Network learning with its characteristics. **(10 Marks)**

Module-4

7 a. Write Naive Bayes classifier algorithm for learning and classifying the text. **(10 Marks)**

b. The following table gives data set about stolen vehicles. Using Naive Bayes classifier, classify the new data (Red, Suv, Domestic).

Colour	Type	Origin	Stolen
Red	Sports	Domestic	Yes
Red	Sports	Domestic	No
Red	Sports	Domestic	Yes
Yellow	Sports	Domestic	No
Yellow	Sports	Imported	Yes
Yellow	Suv	Imported	No
Yellow	Suv	Imported	Yes
Yellow	Suv	Domestic	No
Red	Suv	Imported	No
Red	Sports	Imported	Yes

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(10 Marks)

OR

8 a. Explain Maximum A Posteriori (MAP) hypothesis using Bayes theorem. **(10 Marks)**

b. Prove that maximum likelihood can be used in any learning algorithms that are used to minimize the squared error between actual output hypothesis and predicted outupt hypothesis. **(10 Marks)**

Module-5

9 a. Explain K-nearest neighbour learning algorithm with example. **(10 Marks)**

b. Explain in what respect Reinforcement learning problems differ from other function approximation tasks. **(10 Marks)**

OR

10 a. Explain locally weighted linear regression. **(10 Marks)**

b. Discuss the method of comparing two algorithms. Justify with paired to tests method. **(10 Marks)**

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