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Seventh Semester B.E. Degree Examination, Aug./Sept.2020
Machine Learning

Time: 3 hrs.   Max. Marks: 80

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

Module-1

1 a. What is Machine Learning? Explain different perspectives and issues in machine learning.
(06 Marks)
   b. Explain the steps in designing a learning system.   **(10 Marks)**

OR

2 a. Describe the Candidate-Elimination algorithm. Explain its working, taking the enjoy sport concept and training instances given below:

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	Clod	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Warm	Change	Yes

(10 Marks)
   b. Explain how to model inductive systems by their equivalent deductive systems for Candidate-Elimination Algorithm.   **(06 Marks)**

Module-2

3 a. Explain the concepts of entropy and information gain.   **(06 Marks)**
   b. Describe the ID3 algorithm for decision tree learning.   **(10 Marks)**

OR

4 a. Apply ID3 algorithm for constructing decision tree for the following training example.

Day	Outlook	Temperature	Humidity	Wind	Play Tennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No

(10 Marks)
   b. Explain the issues in decision tree learning.   **(06 Marks)**

Module-3

5 a. Explain appropriate problems for Neural Network Learning with its characteristics.

    (10 Marks)

   b. Explain the single perceptron with its learning algorithm.   **(06 Marks)**

OR

6 a. Explain Back Propagation algorithm.   **(10 Marks)**

   b. Explain the remarks of Back propagation algorithm.   **(06 Marks)**

Module-4

7 a. Explain Naïve Bayes classifier.   **(10 Marks)**

   b. Explain Bayesian Belief Networks.   **(06 Marks)**

OR

8 a. Explain EM algorithm.   **(08 Marks)**

   b. Explain the derivation of K-means algorithm.   **(08 Marks)**

Module-5

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

   b. Explain case based reasoning with example.   **(06 Marks)**

OR

10   Write short note on:

   a. Q learning

   b. Radial basis function

   c. Locally weighted regression

   d. Sampling theory.   **(16 Marks)**

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