CBCS Scheme

USN | | | | | | | | | | | 16SCS41

Fourth Semester M.Tech. Degree Examination, June/July2018
Machine Learning Techniques

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 steps to design a learning system in details with example and diagram. **(08 Marks)**

   b. Describe the find -S algorithm. explain its working by 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	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

(08 Marks)

OR

2 a. Describe candidate–elimination learning algorithm with example. **(08 Marks)**

   b. Illustrate the operation of ID3 for the following training examples given in the table I. Here the target attribute is PlayTennis. Draw the complete decision tree.

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	Strong	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

(08 Marks)

Module-2

3 a. Explain in detail perceptron based ANN system its representation and training rule.
                                                                                (08 Marks)
   b. Explain Back propagation algorithm in detail.   (08 Marks)

OR

4 a. Describe in detail a prototypical genetic algorithm.   (08 Marks)
   b. Explain genetic programming with example.   (08 Marks)

Module-3

5 a. What is the relationship between Bayes theorem and problem of concept learning? Explain
       in detail.   (08 Marks)
   b. Explain likelihood hypothesis for predicting probabilities.   (08 Marks)

OR

6 a. Explain Naïve Bayes classifier by applying it to a concept-learning problem. Use table I and
       novel instance <Outlook = sunny, Temp = cool, Humidity = high, Wind = strong>.(08 Marks)
   b. Explain the EM algorithm in detail.   (08 Marks)

Module-4

7 a. Explain k-nearest neighbor learning algorithm with example.   (08 Marks)
   b. Describe the method of learning using locally weighted linear regression. (08 Marks)

OR

8 a. Explain learning sets of First-order rules in detail with example.   (08 Marks)
   b. Explain how inverting resolution constructs hypotheses by inverting a deductive inference
       rule.   (08 Marks)

Module-5

9 a. Compare inductive learning and analytical learning.   (08 Marks)
   b. Explain the explanation-based learning algorithm PROLOG-EBG.   (08 Marks)

OR

10 a. Explain the Q functions and Q learning algorithm.   (08 Marks)
   b. Explain Q learning for non deterministic Markov Decision Process (MDP). (08 Marks)

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