

CBCS Scheme

USN

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

16SCS41

Fourth Semester M.Tech. Degree Examination, June/July 2018 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)

2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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)

* * * * *