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15CS73

Seventh Semester B.E. Degree Examination, Feb./Mar.2022 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 perspective and issues in machine learning. (05 Marks)
- b. Define well posed learning problems with examples. (05 Marks)
- c. Explain the final design of the checkers learning program. (06 Marks)

OR

- 2 a. 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	War	High	Strong	Cool	Change	Yes

- b. Explain applications of machine learning. (10 Marks)
- (06 Marks)

Module-2

- 3 a. Write ID₃ algorithm for decision tree learning. (06 Marks)
- b. What is decision tree? What are the characteristics of the decision tree learning? (06 Marks)
- c. Explain the concept of entropy and information gain. (04 Marks)

OR

- 4 a. What is a decision tree? Explain its representation and algorithm. (10 Marks)
- b. Explain Inductive Bias and Issues in Decision tree. (06 Marks)

Module-3

- 5 a. Explain appropriate problems for neural network learning with its characteristics. (08 Marks)
- b. Explain in detail perceptron based Artificial Neural Network (ANN) system its representation and training rule. (08 Marks)

OR

- 6 a. Explain the single perceptron with its learning algorithm and its separability and convergence property. (08 Marks)
- b. Explain back propagation algorithm in detail. (08 Marks)

Module-4

- 7 a. Explain likelihood hypothesis for predicting probabilities. (08 Marks)
- b. Explain the EM algorithm in detail. (08 Marks)

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.

OR

- 8 a. Explain Naïve Bayes classifier in detail. (08 Marks)
b. Explain brute force Bayes concept learning. (08 Marks)

Module-5

- 9 a. What is reinforcement learning? (06 Marks)
b. Explain the Q function and Q learning algorithm. (10 Marks)

OR

- 10 a. Explain case based reasoning. (08 Marks)
b. Write K-nearest neighbor algorithm for approximating a discrete valued function. (04 Marks)
c. Define Simple error and True error. (04 Marks)
