

CBCS SCHEME

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15CS73

Seventh Semester B.E. Degree Examination, Jan./Feb. 2023 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 do you mean by a well posed learning problem? Explain the important features that are required to well-define a learning problem. (08 Marks)
- b. Explain Find-S algorithm with given example. Give its application.

Table 1.

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

(08 Marks)

OR

- 2 a. What are the basic design issues and approaches to machine learning? (08 Marks)
- b. Explain the various stages involved in designing a learning system (Checkers learning system). (08 Marks)

Module-2

- 3 a. Greedy learn a decision tree using ID₃ algorithm and draw the tree. (08 Marks)
- b. Compare Entropy and Information gain in ID₃ with an example. (08 Marks)

OR

- 4 a. Describe hypothesis space search in ID₃ and contrast it with candidate elimination algorithm. (08 Marks)
- b. List the issues in Decision Tree learning. Interpret the algorithm with respect to overfitting the data. (08 Marks)

Module-3

- 5 a. Define ANN. Explain the concept of a perceptron with a neat diagram. (08 Marks)
- b. What do you mean by Gradient Descent? Derive the Gradient Descent Rule. (08 Marks)

OR

- 6 a. Derive the Back propagation rule considering the training rule for output unit weights and training rule for hidden unit weights. (08 Marks)
- b. Explain how to learn multilayer networks using Gradient Descent Algorithm. (08 Marks)

Module-4

- 7 a. Explain the concept of Baye's theorem with an example. (08 Marks)
- b. Explain the K-means algorithm with an example. (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 Baye's classifier with an example. (08 Marks)
b. Explain Bayesian belief networks and conditional independence with example. (08 Marks)

Module-5

- 9 a. What is Reinforcement Learning? Explain the Q function and Q Learning algorithm. (08 Marks)
b. Describe K-nearest Neighbour learning algorithm for continuous valued target function. (08 Marks)

OR

- 10 a. Explain locally weighted linear regression. (08 Marks)
b. Explain Binomial Distribution with an example. (08 Marks)
