

CBCS SCHEME

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20SCS/SAM12

First Semester M.Tech. Degree Examination, Jan./Feb. 2021 Artificial Intelligence and Machine Learning

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define Artificial Intelligence. List and explain the four categories of Intelligence Systems. (10 Marks)
- b. Define Production System. Describe the usage of production rules considering the Water Jug problem as an example. (10 Marks)

OR

- 2 a. Describe approach1 and approach2 for implementing the Tic-Tac-Toe game along with advantages and disadvantages of each approach. (10 Marks)
- b. With an example and algorithm, describe the A* algorithm for implementing Best First Search. (10 Marks)

Module-2

- 3 a. Define Terminal Node. Non-Terminal AND Node and Non-Terminal OR Node. Describe AO* algorithm with an example. (10 Marks)
- b. Along with the steps in MIN MAX strategy and functions used, describe the MIN MAX algorithm. (10 Marks)

OR

- 4 a. Define Well-Formed Formula (WFF). List and explain any four equivalence laws with name of relation and equivalence relations. (10 Marks)
- b. List the steps taken to transform the formula into a equivalent Conjunctive Normal Form (CNF). Convert the formula $(\sim A \rightarrow B) \wedge (C \wedge \sim A)$ into its equivalent CNF. (10 Marks)

Module-3

- 5 a. Describe the searching the World Space and searching the Plan space as part of planning as a search strategy. (10 Marks)
- b. Explain the Mean End Analysis (MEA) algorithm considering the Robot moving a large table with two objects as an example. (10 Marks)

OR

- 6 a. With suitable example and diagram, describe the knowledge representation using semantic networks. (10 Marks)
- b. With suitable example, structures and list of facets, explain the knowledge representation using frames. (10 Marks)

Module-4

- 7 a. Describe Joint Probability and Conditional Probability with suitable equations and examples. (10 Marks)
- b. List the advantages and disadvantages of Bayesian Belief Networks. (10 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. With a neat diagram, explain the components of Learning system. (10 Marks)
b. Define Clustering. Explain the classification of clustering algorithms. (10 Marks)

Module-5

- 9 a. Describe the Case Representation Models along with the major challenges in Case Based Reasoning methods. (10 Marks)
b. List and explain the tools for Case Based Reasoning methods. (10 Marks)

OR

- 10 a. Describe the Neuron Model with a neat diagram and activation functions along with the definition of Artificial Neural Networks (ANN). (10 Marks)
b. List and explain the Design Issues of Artificial Neural Networks (ANN). (10 Marks)
