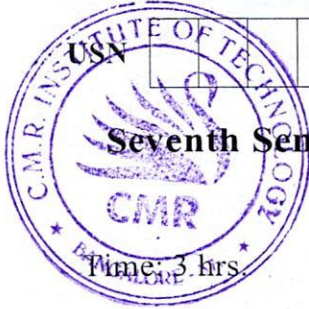


CBCS SCHEME

21CS752



Seventh Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Introduction to AI and ML

Max. Marks: 100

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

Module-1

- 1 a. Define Artificial Intelligence. Explain the below approaches to Artificial Intelligence with respective definitions.
i) Acting Humanly ii) Thinking Humanly (10 Marks)
b. Define Agent. With a neat diagram, explain how agents interact with environment through sensors and actuators. (10 Marks)

OR

- 2 a. Explain the structure of an agent program with an example agent program. (10 Marks)
b. With a neat diagram and agent function, explain the following :
i) Simple Reflex Agents ii) Goal Based Agents (10 Marks)

Module-2

- 3 a. Illustrate with an example, the components of a Well-defined problem. (10 Marks)
b. What are Toy problems and Real-world problems? Explain the formulation of vacuum world problem with a neat diagram of its state space. (10 Marks)

OR

- 4 a. Explain Breadth-First search strategy with a pseudocode for BFS on a graph and simple binary tree. (10 Marks)
b. What is Heuristic search? Explain greedy best-first search with an example. (10 Marks)

Module-3

- 5 a. Discuss different types of Machine Learning with example. (10 Marks)
b. Explain Machine Learning process with a neat diagram. (10 Marks)

OR

- 6 a. Write a note on :
i) Elements of big data ii) Types of data (10 Marks)
b. Explain 4-layer architecture of big data analysis framework. (04 Marks)
c. Write a note on Data Preprocessing step of Big Data processing cycle. (06 Marks)

Module-4

- 7 a. Explain Bivariate data with an example. (03 Marks)
b. Define covariance and correlation. Find the covariance and correlation coefficient of data.
 $X = \{1, 2, 3, 4, 5\}$ and $Y = \{1, 4, 9, 16, 25\}$ (07 Marks)
c. Write the procedure for applying Gaussian elimination method. Solve the following set of equations using Gaussian elimination method:

$$2x_1 + 4x_2 = 6$$

$$4x_1 + 3x_2 = 7$$

(10 Marks)

OR

- 8 a. Write Find-S algorithm. Apply Find-S algorithm on the below dataset that contains details of the performance of students and their likelihood of getting a job offer or not in their final semester.

CGPA	Interactiveness	Practical Knowledge	Communication Skills
≥ 9	Yes	Excellent	Good
≥ 9	Yes	Good	Good
≥ 8	No	Good	Good
≥ 9	Yes	Good	Good
Logical Thinking	Interest	Job Offer	
Fast	Yes	Yes	
Fast	Yes	Yes	
Fast	No	No	
Slow	No	Yes	

- (10 Marks)
 b. List the limitations of Find-S algorithm. (03 Marks)
 c. Write K-Nearest-Neighbors (K-NN) algorithm. (07 Marks)

Module-5

- 9 a. What are artificial neurons? Describe the structure of a single neuron with a neat diagram. (04 Marks)
 b. Explain simple model of an artificial neuron. (08 Marks)
 c. Write and explain Perceptron algorithm. (08 Marks)

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OR

- 10 a. Elaborate on the types of Artificial Neural Networks. (10 Marks)
 b. Write and explain the algorithm for Radial Basis Function Neural Network. (10 Marks)
