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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester Regular Examinations August-2022

ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

(Common to CSE & CSIT)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Explain the elements of an agent and the characteristics of intelligent agent. L1 6M
- b Exemplify the necessary components to define an AI problem with an example. L2 6M

OR

- 2 a Consider a water jug problem. You are 2 jugs: a 4-gallon and 3-gallon jugs. Neither has any measuring mark on it. There is a pump that can be used to fill the jugs with water. How can you get exactly 2-gallon of water into a 4-gallon jug? State the production rules for the water jug problem. L4 6M
- b Apply problem solving algorithm to measure performance. L6 6M

UNIT-II

- 3 a Describe the heuristic search technique applied to a hill-climbing problem with an example. L1 6M
- b A problem-solving search can precede either forward or backward. Discuss the factors that determine the choice of direction for a particular problem. L4 6M

OR

- 4 a Explain about game playing using backtracking search with an example. L1 6M
- b Discuss about constraint satisfaction problems with an example for each. L2 6M

UNIT-III

- 5 a Differentiate Univariate and Multivariate trees. L3 4M
- b i) Identify the first splitting attribute for decision tree by using ID3 algorithm L4 8M

With the following dataset.

Major	Experienced	Tie	Hired?
CS	Programming	Pretty	NO
CS	Programming	Pretty	NO
CS	Management	Pretty	YES
CS	Management	Ugly	YES
Business	Programming	Pretty	YES
Business	Programming	Ugly	YES
Business	Management	Pretty	NO
Business	Management	Pretty	NO

- ii) Explain perceptron learning algorithm.

OR

- 6 a Discuss the relationship between the maximum likelihood hypothesis and the least squared error hypothesis. L3 6M
- b Explain in detail about multilayer neural networks and back propagation algorithm. L1 6M

UNIT-IV

- 7 a Explain about K-means algorithm with an example. L1 6M
b With an example explain Hierarchical clustering. L5 6M

OR

- 8 a Explain mathematics behind PCA (Principal Components Analysis). L1 6M
b Discuss about Multidimensional Scaling with an example. L1 6M

UNIT-V

- 9 a Describe k- Nearest-Neighbor estimator in detail. L1 6M
b Explain about the Least-Squares method. L1 6M

OR

- 10 a Distinguish between supervised learning and Reinforcement learning. L2 6M
Illustrate with an example.
b Explain about partially observable states with an example. L1 6M

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