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Total Number of Pages : 02

B.Tech/
Integrated Dual Degree (B.Tech and M.Tech)
RCS5D002

5th / 7th Semester Reg/Back Examination: 2024-25

Artificial Intelligence & Machine Learning

AERO, AE, AME, CST, CSEDS, CSE, CSIT, CSEAIME, ELECTRICAL & C.E, ELECTRONICS
& C.E, IT, MINING, CSE

Time : 3 Hour

Max Marks : 100

Q. Code : R338

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right hand margin indicate marks.

Part-I

Q1 Answer the following questions:

(2 x 10)

- Define an intelligent agent with an example.
- What is the difference between breadth-first search and depth-first search?
- Explain the concept of Alpha-Beta pruning in adversarial search.
- What are propositional logic and its significance in AI?
- State Bayes' theorem with an example.
- What is the purpose of Bayesian networks in AI?
- Define the term "Expert System" with an example.
- Explain the concept of neural net learning in machine learning.
- Differentiate between supervised and unsupervised learning.
- What is the role of heuristic search in problem-solving?

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Explain the structure of an intelligent agent.
- What are the different types of environments in which AI agents operate?
- Describe the A* search algorithm with an example.
- How is logical reasoning applied in knowledge-based agents?
- Explain the syntax and semantics of First-Order Logic.
- What is the difference between propositional and first-order inference?
- Describe Bayes' rule and its application in probabilistic reasoning.
- What is the significance of independence in probabilistic reasoning?
- Discuss the concept of learning from examples with an example.
- Explain the architecture of an Expert System.
- What is meant by explanation-based learning?
- Describe genetic learning in AI.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

- Q3** Explain the concept of problem-solving agents in detail. Discuss different uninformed search strategies with examples. **(16)**
- Q4** Describe the Mini-Max algorithm and Alpha-Beta pruning. How do these methods optimize decision-making in adversarial search? **(16)**
- Q5** Explain the concept of Bayesian networks. Discuss both exact and approximate inference techniques used in Bayesian networks. **(16)**
- Q6** Discuss various machine learning methods. Provide a detailed explanation of neural net learning and its applications in AI. **(16)**