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18AI55

Fifth Semester B.E. Degree Examination, June/July 2024
Principles of Artificial Intelligence

Time: 3 hrs. Max. Marks: 100

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

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.

Module-1

1 a. What is Artificial Intelligence? List and discuss applications of AI. **(10 Marks)**

b. Define Intelligent systems. Explain the 4 categories on the design of Intelligent systems. **(10 Marks)**

OR

2 a. What is state-space search method of problem representation? Explain Eight-Puzzle problem with illustration. **(10 Marks)**

b. Discuss components of AI program. Explain control strategies. **(10 Marks)**

Module-2

3 a. Explain problem reduction with respect to AND-OR graphs to solve tower of Honai problem. **(10 Marks)**

b. Explain MINMAX procedure. Write the algorithm for MINIMAX. **(10 Marks)**

OR

4 a. What is iterative deepening? Explain Alpha-Beta pruning. **(10 Marks)**

b. Write short note on two-player perfect information games. **(10 Marks)**

Module-3

5 a. Write a note on : (i) Natural deduction system (ii) Axiomatic system **(10 Marks)**

b. Explain semantic tableau system in propositional logic. Construct a semantic tableau for a formula, $(A \wedge \sim B) \wedge (\sim B \rightarrow C)$. **(10 Marks)**

OR

6 a. With an illustration, explain the process of converting a formula into a set of clauses. **(10 Marks)**

b. Explain resolution of clauses, using resolution refutation principle show that CVD is logical consequence of $S = (A \vee B, \sim A \vee D, C \vee \sim B)$. **(10 Marks)**

Module-4

7 a. Explain goal stack planning with an example. **(10 Marks)**

b. What is blocks word problem? Explain the components of planning system. **(10 Marks)**

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OR

8 a. Explain Means-Ends analysis technique. **(10 Marks)**

b. Explain non linear planning strategies. **(10 Marks)**

Module-5

9 a. Explain the knowledge representation using semantic network with the help of an example. **(10 Marks)**

b. How are frames used for knowledge representation? Explain using an example. **(10 Marks)**

OR

10 a. Write a note on Expert systems. **(10 Marks)**

b. Explain the general steps in the development of Expert systems. Also discuss the benefits of Expert systems. **(10 Marks)**

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