

# CBCS SCHEME

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18AI55

## Fifth Semester B.E. Degree Examination, Jan./Feb. 2023 Principles of Artificial Intelligence

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. List out the applications of Artificial Intelligence. Explain in detail how tic tac toe game is played using magic square of order 3. (10 Marks)
- b. Explain in brief the components of AI program and categorization of Intelligent Systems. (10 Marks)

OR

- 2 a. Define State Space. State Space Search. List the rules for water jug problem and use the production rules for solving water jug problem taking 5-gallon and 3 gallon water jug. (10 Marks)
- b. What is constraint satisfaction problem? Solve the below cryptarithmic problem  
BASE + BALLS → GAMES (10 Marks)

### Module-2

- 3 a. What is problem reduction and AND-OR graph? Solve tower of Hanoi considering 3 discs problem. (10 Marks)
- b. Discuss and develop AO\* algorithm by taking an example. (10 Marks)

OR

- 4 a. Develop MINIMAX algorithm. Explain with an example. (10 Marks)
- b. Explain in detail  $\alpha - \beta$  pruning with examples. (10 Marks)

### Module-3

- 5 a. Explain in detail the steps for conversion of a formula into a set of clauses. (10 Marks)
- b. Show that  $\alpha : (A \cap B) \cap (B \rightarrow \sim A)$  is unstable using the Tablean method. (10 Marks)

OR

- 6 a. Discuss satisfiability and unsatisfiability. (10 Marks)
- b. Discuss semantic Tablean system in propositional logic. (10 Marks)

### Module-4

- 7 a. Discuss types of planning system. (10 Marks)
- b. Discuss in detail block world problem and logic based planning. (10 Marks)

OR

- 8 a. What is Means-Ends Analysis? Explain with example. (10 Marks)
- b. Discuss non-linear planning strategies and learning plans. (10 Marks)

### Module-5

- 9 a. Discuss different approaches to knowledge representation. (10 Marks)
- b. Explain in detail knowledge representation using semantic network. (10 Marks)

OR

- 10 a. Define Expert System. Discuss introduction phases in detail. (10 Marks)
- b. Discuss and differentiate architecture of Expert System vs Traditional System. (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.