Artificial Intelligence
Paper : MCA 405

Time: Three Hours   **Maximum Marks: 80**

Note: Students will be required to attempt FIVE questions in all. Question No. 1 is
          Compulsory. In addition to compulsory question, students will have to attempt
          Four more questions, selecting one question from each Unit.

1.   (i)   What is skolemization?
      (ii)   Define monotonicity.
      (iii)   What is unit resolution?
      (iv)   What is inference engine in expert system
      (v)   What is the use of mutation operator in genetic algorithm?
      (vi)   Discuss the use of = operator in PROLOG
      (vii)   What are the space complexities of depth first and breadth first
                 search?
      (viii)   What is Prenex Normal Form (PNF)/

UNIT-I

2.   (a)   what is Artificial Intelligence? Write the short note on the following
             applications of Artificial Intelligence:
             (i)   Natural Language Processing
             (ii)   Theorem Proving
      (b)   What is Most General Unifier (MGU)? Write the unification algorithm to
             find the MGU.
3.   Differentiate between following:
                   (a) Modus ponen and modus tollen
                   (b) Associative network and conceptual graph
                   (c) Set of support and linear input form resolution

UNIT-II

4.   (a)   What do you understand by data driven and goal driven search? Discuss
             the characteristics of the problem motivating the use of data driven or goal
             driven search.
      (b)   What do you understand by hill climbing search ? what is steepest hill
             climbing? Explain.
5.   (a)   What do you understand by admissible heuristic? Explain using 8-puzzle
             problem.
      (b)   What do you understand by alpha and beta pruning? How do they help in
             pruning the search area? Explain

UNIT-III

    6.   Differentiate between following:
        (a)   Commutative and non-Commutative production system
        (b)   Propositional logic and fuzzy logic
    7. (a)   What is an Expert System? Discuss the rule based architecture of expert system.
        (c)   Discuss in brief Standard certainty factor algebra

UNIT-IV

    8.   (a)   What are the different sections in PROLOG program? Discuss their uses.
        (b)   Differentiate between Roulette wheel and ranked selection in genetic algorithm.
    9.   Write short notes on the following:
        (a)   Learning automata
        (b)   Encoding techniques in Genetic algorithm