

MCA/D06
Artificial Intelligence
MCA -502

Time : 3 Hours

MM:50

Note:- Attempt any Five questions. All questions carry equal marks.

- 1 Explain the differences and similarities between depth first search and breadth first search. Give examples of the kinds of problems where each would be appropriate.
- 2 Explain what is meant by the following terms in relation to search methods : Complexity, Completeness and Optimality. What is the complexity (in space and in time) of the following search methods:
depth first search, breadth first search and best first search.
- 3 Explain why the alpha-beta pruning procedure will always generate the same answer minimax without pruning. Why is it useful?
- 4(a) What do you understand by deductive reasoning, abductive reasoning and inductive reasoning? Differentiate between them using suitable examples.
- (b) What is the difference between modus ponens and abduction? Show that modus ponens is sound but abduction is not.
- 5(a) Explain the concept of proof by refutation.
- (b) Convert the following expression into a set of clauses:

$$(x)(P(x) \rightarrow (A(x) \cap b(x) \cup \sim c(x,a)))$$
- 6 Describe the architecture of Expert System and describe the roles of the various people involved in it.
- 7 Explain the meaning of the following terms in the context of genetic algorithms: fitness, chromosome, gene, population, generation, crossover, mutation, deception
- 8 Differentiate between following:
 - (a) Uniformed search and Informed search
 - (b) Admissibility and Monotonicity
 - (c) Declarative knowledge and Procedural knowledge
- 9 Write notes on following:
 - (a) Turing Test
 - (b) Semantic Network
 - (c) Scripts

10 What do you understand by Artificial Intelligence? Justify the use of AI approach in the following applications.

- (a) Game Playing
- (b) Natural Language Processing
- (c) Theorem Proving