



Subject: - (Artificial Intelligence) (01CE0702)

Date:- 11/10/2019

Total Marks:-100

Time: - 03:00 hours

Instructions:

1. All Questions are Compulsory.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Question: 1. a) Answer below the given MCQs

[10]

1. What are properties of good knowledge representation system?
A: Representation Adequacy
C: Inferential Efficiency
B : Inferential Adequacy
D: All of them
2. Let P and Q be propositional symbols. Which of the following are models of $\neg P \vee Q \Rightarrow \neg P \wedge Q$?
A: P = false, Q = false
C: P = true, Q = false
B : P = false, Q = true
D: P = true, Q = true
3. Which search strategy is also called as blind search?
A: Uninformed search
C: Simple reflex search
B: Informed search
D: All of them
4. When is breadth-first search optimal?
A: When there is less number of nodes
C: When all step costs are unequal
B: When all step costs are equal
D: None of the mentioned
5. Which is the most straightforward approach for planning algorithm?
A: Breadth-first search
C: Depth-first search
B : State-space search
D: Hill-climbing search
6. Which is used to construct the complex sentences?
A: Symbols
C: Logical Connectives
B : Connectives
D: All of them
7. Which search is equivalent to min-max search eliminates the branches that cannot influence final decision?
A: Breadth-first search
C: Hill-climbing search
B : Alpha-Beta pruning
D: None of the above
8. A* algorithm is based on
A: Breadth-first search
B: Best-first search
9. In greedy approach evaluation function is
A: Heuristic search
B: Path cost from start node + Heuristic
C: Path cost from start node to current node
D: None of the given

10. To overcome the need to backtrack in constraint satisfaction problem can be eliminated by

A: Forward Searching

C: Backtrack after a forward search

B : Constraint Propagation

D: Omitting the constraints and focusing only on goals

(b) Answer following

[10]

- I. Define Artificial Intelligence.
- II. What is meta-heuristic search? strategies that guide the search process to find near-optimal solutions.
- III. Explain Brute Force approach. Trying all possible soln. for best optimal soln.
- IV. Explain properties of propositional logic. Connectives, Truth Table, Tautology & Contradictions, Truth Values
- V. Discuss agents. Propositions

Question: 2.

an agent is a computational entity that perceives its environment through sensors and acts upon that environment through actuators, with the goal of achieving specific objectives.

(a) Explain BFS and DFS with suitable example.

[08]

(b) Differentiate between simple and steepest Hill Climbing.

[08]

OR

(b) Differentiate between informed search and uninformed search.

[08]

Question: 3.

(a) Explain different approaches of knowledge representation.

[08]

(b) Discuss the process of pruning a CLOSED list.

[04]

(c) Write a short note on markov decision process.

[04]

OR

(a) Explain Min-max algorithm with suitable example.

[08]

(b) Discuss all steps of alpha-beta pruning.

[04]

(c) Write a short note on agents.

[04]

Question: 4.

(a) Explain travelling salesman problem with any AI technique.

[08]

(b) Discuss pro's and con's of iterative deepening of A*.

[04]

(c) Differentiate between meta-heuristic and heuristic search.

[04]

OR

(a) Explain and discuss propositional logic

[08]

(b) Discuss generate and test algorithm along with its types.

[04]

(c) Differentiate between biological and artificial neural network.

[04]

Question: 5.

(a) Consider the following facts and translate into predicate logic formulae:

(i) The members of St. Bridge club are Joe, Sally, Bill and Ellen.

(ii) Joe and Bill are best friends.

(iii) Joe is married to Sally.

[08]

- (iv) Bill is Ellen's brother.
 - (v) The spouse of every married person in the club is also in the club.
 - (vi) The last meeting of club was at Joe's house.
- (b) Explain state space representation of a problem. Define water jug problem as representation of state space search. [04]
- (c) Explain A*algorithm with suitable example. [04]

OR

- (a) Consider the following facts and translate into predicate logic formulae:
- (i) John likes all kind of food.
 - (ii) Apples are food.
 - (iii) Chicken is food.
 - (iv) Anything anyone eats and isn't killed is food. [08]
 - (v) Bill eats peanuts and is still alive.
 - (vi) Sue eats everything Bill eats.
- (b) Explain Branch and Bound with suitable example. [04]
- (c) Explain AO*algorithm with suitable example. [04]

Question: 6.

- (a) Explain variable neighbourhood method (VNS) in detail. [08]
- (b) Explain task domains of AI with appropriate example. [04]
- (c) Discuss the problem of local maximum in hill climbing. [04]

OR

- (a) Consider the following initial and goal state of 8-puzzle problem. Draw the search tree for initial three iterations of A*algorithm to reach from initial state to goal state. Assume suitable heuristic function for the same.

Initial state		
	1	2
3	4	5
6	7	8

Goal state		
1	2	3
8		4
7	6	5

- [08]
- (b) Explain all the problem characteristics of artificial intelligence. [04]
- (c) Explain turing test with suitable example. [04]

---Best of Luck---

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