

U.G. 6th Semester Examination - 2021

COMPUTER SCIENCE

Course Code : BCOSDSHT5

Course Title: Artificial Intelligence

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Choose the correct alternative for any **ten** of the following: 1×10=10
- a) The main advantage of any heuristic search algorithm over blind search one is with respect to
 - i) Time complexity
 - ii) space complexity
 - iii) Completeness
 - iv) optimality
 - b) Resolution-refutation is best association with
 - i) sound rule of inference
 - ii) complete rule of inference
 - iii) Both (i) and (ii)
 - iv) None of these

- c) Algorithm that gives optional solution
 - i) Hill climbing
 - ii) BFS
 - iii) Blind search
 - iv) A*
- d) What is the consequence between a node and its predecessors while creating bayesian network?
 - i) Functionally dependent
 - ii) Dependant
 - iii) Conditionally independent
 - iv) Both Conditionally dependant & Dependant
- e) Which is not a property of representation of knowledge?
 - i) Representational Verification
 - ii) Representational Adequacy
 - iii) Inferential Adequacy
 - iv) Inferential Efficiency
- f) Which search is similar to minimax search?
 - i) Hill-climbing search
 - ii) Depth-first search
 - iii) Breadth-first search
 - iv) All of the mentioned

- g) What is the goal of artificial intelligence?
 - i) To solve real-world problems
 - ii) To solve artificial problems
 - iii) To explain various sorts of intelligence
 - iv) To extract scientific causes
- h) Which is not a familiar connectives in First Order Logic?
 - i) and
 - ii) iff
 - iii) or
 - iv) not
- i) What do you mean by backward chaining?
- j) What is Learning in AI?
- k) What is Alpha-beta pruning?
- l) Who is the father of artificial intelligence?
- m) Which search method takes less memory?
- n) What is supervised learning?
- o) Which programming language is used for AI?

2. Answer any **five** questions: 2×5=10

- a) What is local maxima problem?
- b) Define Artificial Intelligence.
- c) What is a uniform cost search algorithm?
- d) Why is DFS not always complete?

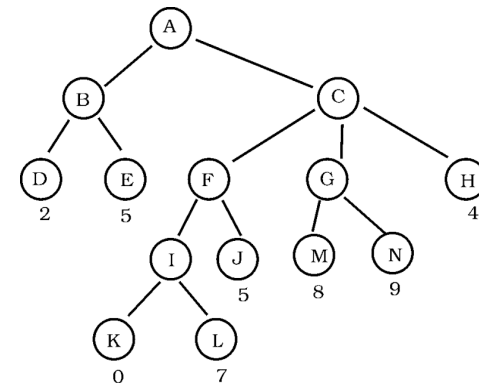
- e) What are the four types of AI?
- f) Explain in brief the term "Q-learning".
- g) What are the parsing techniques used in AI?
- h) What is Tower of Hanoi?

3. Answer any **two** questions: 5×2=10

- a) What is agent? What are the disadvantages of table driven agent?
- b) Describe Hill climbing algorithm. What are the problems of Hill climbing algorithm?
- c) Describe BFS procedure used to AI problem.

4. Answer any **one** question: 10×1=10

- a) Consider the following game tree in which static scores are all from first player's point of view



- i) Which would be his best first move if

MINIMAX algorithm is used ?

- ii) Which branches will be pruned if α - β pruning algorithm is used?
- b) Write A* Algorithm and Explain with an example.
- c) Consider the 3 puzzle problem shown in the figure 1:

2	3
1	

Initial

1	2
3	

Final

Figure 1

Possible operators (in order) are: up, down, left, right; Assume that repeated states are not detected.

- i) Draw the search tree using breadth first search.
- ii) Would depth first search find the goal? Explain.
- iii) How many nodes would be generated if Iterative Deepening is used starting with depth increment one?
