

BCA Examination 2023-24

(Even Semester)

ARTIFICIAL INTELLIGENCE

Time : Three Hours]

[Maximum Marks : 60

Note :- Attempt all questions.

SECTION - A

1. Attempt all parts of the following : $8 \times 1 = 8$
- (a) What is problem decomposition?
 - (b) What is weak AI and strong AI?
 - (c) Convert the following sentences into predicate logic (first order logic).
 - (i) Lata dislikes children who drink tea.
 - (ii) Any person who is respected by every person is a king.

[P. T. O.]

- (d) How is AI useful in game playing techniques.
- (e) List the advantages of depth first search algorithm.
- (f) What is inductive learning?
- (g) List the drawback of a heuristic search technique.
- (h) Explain top down parsing.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$
- (a) What is problem reduction technique? Using this explain AO* search with an example.
 - (b) What is AI? Define artificial intelligence on the basis of "system that think rationally" and "system that act like humans".
 - (c) Using the inference rules of propositional logic, prove the validity of following axioms :
 - (i) If either algebra is required or geometry is required then all students will study mathematics.

(ii) Algebra is required and trigonometry is required therefore all students will study mathematics.

(d) What are local search algorithms? Explain hill climbing search.

SECTION - C

Note :- Attempt all questions. Attempt any two parts from each questions. $8 \times 5 = 40$

3. (a) Explain goal based agent and utility based agent architecture with proper diagram.

(b) Show that DFS is neither complete nor optimal search.

(c) Explain water jug problem using state space search. Generate production rules for this problem.

4. (a) What is best first search algorithm? Explain. Give an example also. Compare best first search with hill climbing approach.

(b) Differentiate between uninformed and informed search technique.

- (c) Define the term logic. What is the role of logic in artificial intelligence? Compare propositional logic with first order logic.
- 5. (a) What is control strategy and production system? How this is helpful in AI. Give example with its types also.
- (b) What are the different forms of learning? Explain.
- (c) Explain A* search algorithm. Discuss about the admissibility of A* algorithm.
- 6. (a) Define the term knowledge. What is the role of knowledge in artificial intelligence? Explain various techniques of knowledge representation.
- (b) Differentiate between declarative knowledge and procedural knowledge.
- (c) What do you mean by neural network and the use of activation function in neural network?