



ST. FRANCIS DE SALES COLLEGE

A FRANSALIAN INSTITUTE OF HIGHER EDUCATION **AUTONOMOUS**

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END SEMESTER EXAMINATION –NOV/DEC 2025

COMPUTER SCIENCE – III SEMESTER BCA

25BCA35: ARTIFICIAL INTELLIGENCE

Time: 3 Hours

Max. Marks: 80

Instruction: Answer should be written completely in English.

SECTION - A

Answer any **FIVE** questions. Each question carries **TWO** marks.

(5X2=10)

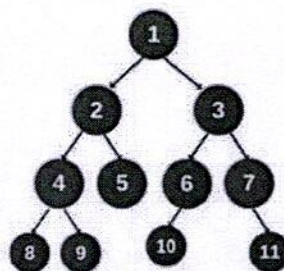
1. What is an agent in AI?
2. Identify the type of environment PEAS for the Wumpus World.
3. State one real-life application of constraint satisfaction problems (CSPs).
4. Write the main idea of Iterative Deepening Search (IDS).
5. Write the propositional formula for: "If it rains, then the ground is wet."
6. Distinguish between forward and backward chaining.
7. Differentiate between syntax and semantics in NLP.

SECTION - B

Answer any **SIX** questions. Each question carries **FIVE** marks.

(6X5=30)

8. Explain the structure of an intelligent agent with a neat diagram. Provide a simple real-world example.
9. Construct DFS and BFS for the following tree.



10. Differentiate between Best-First Search and AO* search.
11. Explain Constraint propagation in CSP with an example (e.g., map colouring).
12. Write well-formed formula (WFF) in predicate logic for the following.
 - a. Everybody loves Raymond.
 - b. Everybody loves somebody.
 - c. There is somebody whom everybody loves.
 - d. There is somebody who Raymond doesn't love.
 - e. There is somebody whom no one loves.



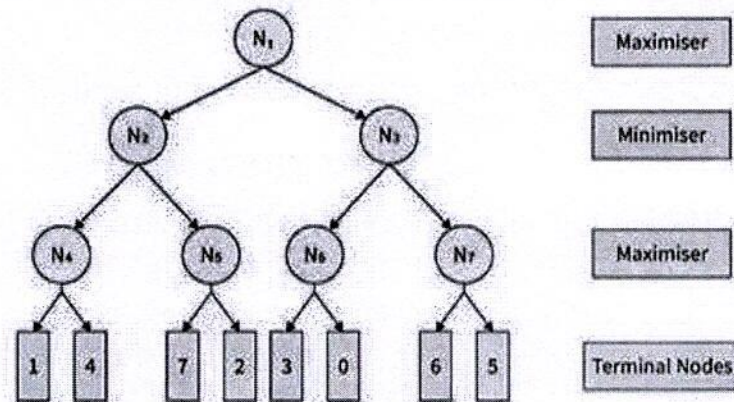
13. Construct a knowledge base using propositional logic for the statement “All humans are mortal, and Socrates is human”.
14. Describe the differences among supervised, unsupervised, and reinforcement learning.
15. Discuss the social impacts of AI in Education and Employability.

SECTION - C

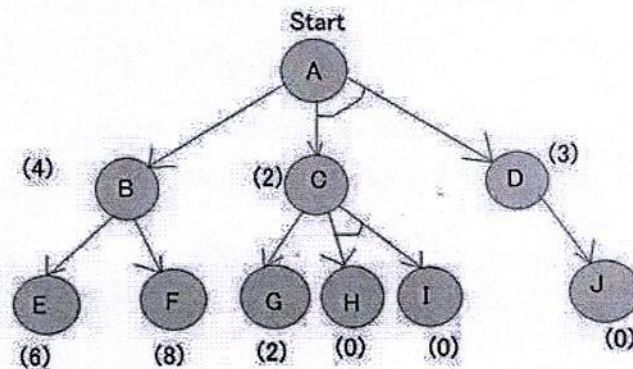
Answer any **FIVE** questions. Each question carries **EIGHT** marks.

(5X8=40)

16. Differentiate between knowledge-based agents and learning agents with neat diagrams.
17. Show how alpha-beta pruning reduces the number of nodes expanded in a minimax game tree.



18. With a worked-out example, explain the *AO** search algorithm.



19. Design a logical agent for the Wumpus World that uses inference to locate the Wumpus. Explain each step of reasoning.
20. Define logic-based agents. For the following clause prepare a detail truth table $(P \vee Q) \rightarrow R$.
P - The AI teacher is available, Q - The classroom is free as per the timetable, R- The AI class is held.
21. Describe the major components of an Expert System and their functions, explain with a neat diagram of expert system architecture.
22. Explain NLP pipeline (or the steps) with relevant examples.

