

Date: 12/03/25

(2½ Hours)

[Total Marks: 75]

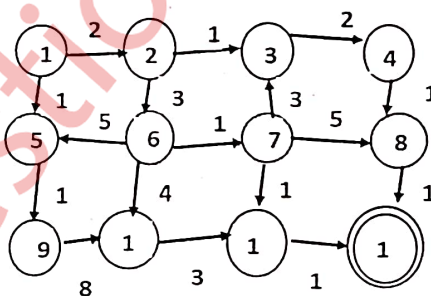
- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

1. Attempt any three of the following: 15

- What do you mean by Artificial Intelligence? List out its applications.
- List and explain goals of artificial Intelligence.
- State the disadvantages of Artificial Intelligence.
- Define Intelligent Agent. Draw and explain working of model based intelligent agent.
- List and explain the properties of environment.
- Define PEAS. List out the PEAS factors contributing to Self-driving car.

2. Attempt any three of the following: 15

- State the steps performed by Problem-solving agent.
- Write an algorithm of breath first search.
- Draw state-space tree for tower of Hanoi by considering 3 disks.
- Write A* Algorithm.
- Find the final path and cost for the following graph by implementing uniform cost search algorithm.



- State the disadvantages of hill climbing algorithm.

3. Attempt any three of the following: 15

- State the applications of min-max algorithm.
- Write a Pseudo code of alpha beta pruning.
- Explain water jug problem with suitable example.
- Explain wumpus world problem.
- State the applications of Bayes theorem in Artificial Intelligence
- Write a note on propositional logic.

4. Attempt *any three* of the following:

15

- a. State the difference between Propositional Logic and First Order Logic.
- b. State the applications of Unification algorithm.
- c. Discuss the resolution process and draw refutation tree for the given set of clause.
[$P(x) \vee Q(x), \neg P(x), \neg Q(x) \vee R(x), \neg R(x) \vee Y(x), \neg Y(x) \vee F(x), \neg F(x) \vee B(x), \neg B(x)$]
- d. Find the First Order Logic form of the following statements:
 - 1) All humans are mortal.
 - 2) Some people have children.
 - 3) All students enrolled in a course are required to attend lectures.
 - 4) Every customer can purchase items.
 - 5) All patients with a fever should see a doctor.
- e. Differentiate between forward and backward chaining.
- f. State the advantages of artificial neural network.

5. Attempt *any three* of the following:

15

- a. Discuss the applications of generative AI.
- b. Explain the blocks of world problem with suitable example.
- c. Write a note on classical planning.
- d. List and explain the components of multi-agent planning.
- e. What are the benefits of hierarchical planning?
- f. State the difference between feedforward and feed backward neural network.
