



Term Evaluation (Odd) Semester Examination September 2025

Roll no. 2218364

Name of the Course: B. Tech., CSE
Semester: VII
Name of the Paper: Artificial Intelligence
Paper Code: TCS-706
Time: 1.5 hour

Note:

Maximum Marks: 50

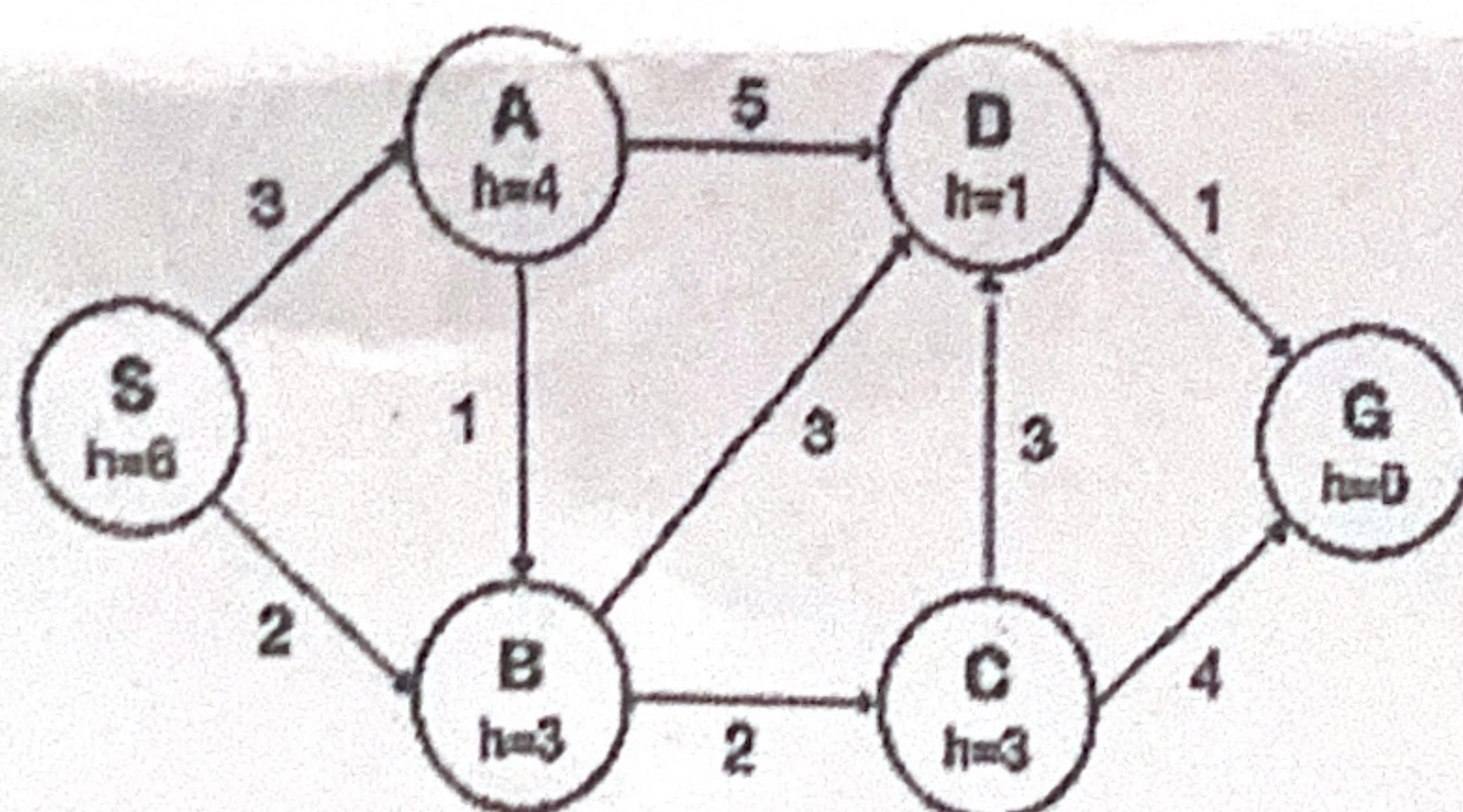
- (i) Answer all the questions by choosing any one of the sub-questions
- (ii) Each question carries 10 marks.

Q1.

- a. What do you mean by the term "Artificial Intelligence"? Explain, how simulation of intelligent behavior is achieved in AI systems. Explain with the help of an appropriate examples from at least two different domains such as healthcare, gaming, or robotics. (10 Marks) CO1

OR

- b. List out four applications of artificial intelligence. Consider the given directed graph and apply A* algorithm to compute the optimal cost from source node to destination node. Given that, the value on all the edges indicate the actual cost and the value inside the vertices indicate heuristic estimation cost of that node.



Q2.

(10 Marks)

- a. Describe parsing techniques used in Natural Language Processing (NLP). Differentiate between top-down parsing and bottom-up parsing with suitable examples. CO2

OR

- b. Explain the concept of context-free grammars (CFGs) in the context of NLP. Design a CFG for the following English sentences and also show the parse tree for any one of the sentences: "The man eats a Mango.", "The boys plays the guitar."



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Q3. (10 Marks)

- a. According to many computer scientists, "Natural language processing, visual perception, and automated reasoning are crucial for developing an intelligent systems." Justify this statement by explaining how these three components interact in a real-world AI application such as self-driving cars or robotics.
CO2

OR

- b. Explain how automated reasoning works in artificial intelligence. Also discuss forward chaining and backward chaining with an appropriate examples.

Q4. (10 Marks)

- a. Differentiate between heuristic algorithms and solution-guaranteed algorithms in AI. Also give two examples of each and explain in which situations each type is more suitable and why?
CO1

OR

- b. In the context of problem-solving in games, explain the working of Min-Max algorithm with suitable example. Also explain how heuristic techniques improve its efficiency?

Q5. (10 Marks)

- a. Explain the difference between grammar-based analyzers and grammar-free analyzers in NLP. Also, describe how they are used in sentence generation and translation.
CO2

OR

- b. With an appropriate example, explain Shank's Conceptual Dependency Theory. Also explain how it is used to represent the meaning of a sentence.