

TE/COMP/VI/C-Scheme / DEC-2024 / 12-12-2024

Time: 3Hrs.

Marks: 80

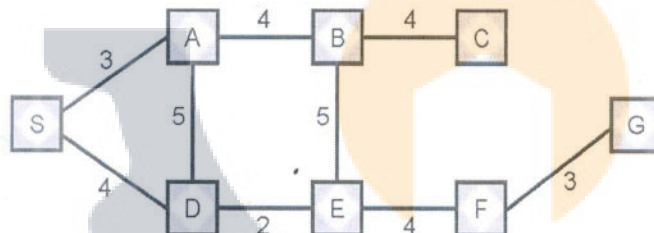
NOTE: - Q1 is compulsory  
Solve any three from remaining.



- Q1. Solve any **four** from following. [20]
- Explain the concept of Conditional order planning.
  - Explain the working of reinforcement learning.
  - Describe four categorize of Artificial Intelligence.
  - Illustrate the application areas of AI in the Robotics.
  - Generate the parse tree for a sentence "The *cat* ate *the* fish".

- Q2. a. All people who are graduating are happy. All happy people smile. Someone is graduating. Convert to FOL and CNF, Also Prove that "Is someone smiling?" [10]  
Solve using resolution.
- b. Design a planning problem using STRIP for Air cargo transport. It involves [10]  
loading and unloading cargo onto and off of planes and flying it from place. Initial State: At SFO airport, Cargo1, Plane1 and at JFK airport, Cargo2, Plane2 is present. Goal State: At SFO airport Cargo2 and at JFK airport Cargo1 is present.

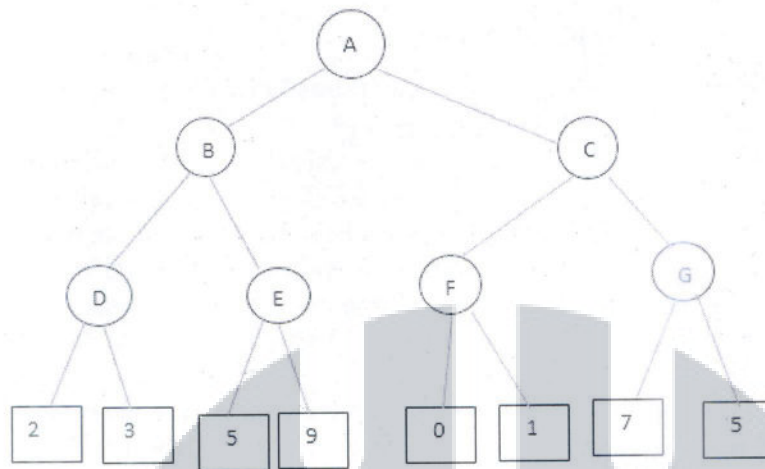
- Q3. a. Apply greedy best-first search. At each iteration, each node is expanded using [10]  
evaluation function  $f(n) = h(n)$ .  $h(S) = 10$ ,  $h(A) = 10$ ,  $h(D) = 8$ ,  $h(B) = 6$ ,  $h(E) = 6.5$ ,  $h(C) = 4$ ,  $h(F) = 3$ ,  $h(G) = 0$ . S is start state and G is goal state.



- b. Explain the Depth Limit search and Depth first iterative deepening search. [10]
- Q4. a. Formulate the problem, Choose the formulation that is precise enough to be [10]  
implemented. Also identify the initial state, goal test, successor function, and cost function for the following.  
**Problem statement:** Autonomous Taxi driver
- b. Explain the concept of PAC learning [10]

- Q5. a. Task of cleaning house has been assigned to a vacuum cleaner robot. Initial [10]  
location of robot is not known. Robot has to execute appropriate actions in order to clean house. Identify the appropriate type of an agent and applicable task environment, also identify the PEAS parameters.

- b. Apply alpha beta pruning on following graph



**Q6.** Write detailed note on following. (Any two)

[20]

- Wumpus World Environment
- Differentiation of Forward and Backward Chaining
- Language models of Natural Language Processing

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