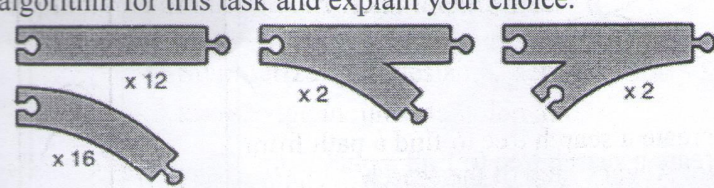


**K. J. Somaiya Institute of Technology, Sion, Mumbai-22**  
(Autonomous College Affiliated to University of Mumbai)

July/ August 2024  
 B.Tech Program: Computer Engineering Scheme: I/II/IIB/: II  
 Supplementary Examination: TY Semester: VI  
 Course Code: CSE604 Course Name: Artificial Intelligence  
 Date of Exam: 05/08/24 Duration: 2.5 Hours Max. Marks: 60

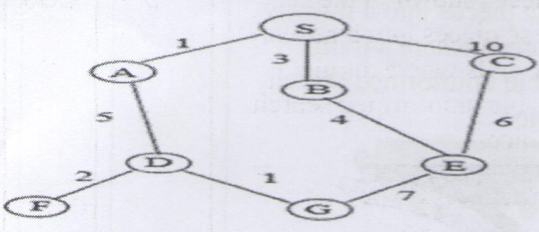
**Instructions:**  
 (1) All questions are compulsory.  
 (2) Draw neat diagrams wherever applicable.  
 (3) Assume suitable data, if necessary.

		Max. Marks	CO	BT level
<b>Q 1</b>	<b>Solve any six questions out of eight.</b>	12		
i)	Explain any two components of an expert system which plays a crucial role in its operation.	2	CO6	R
ii)	Describe any one example of how AI systems demonstrate rational decision making in real-world scenarios?	2	CO1	U
iii)	For the Elevator Control System example, give a PEAS description of the task environment.	2	CO2	Ap
iv)	A basic wooden railway set contains the pieces shown in the following figure. The task is to connect these pieces into a railway that has no overlapping tracks and no loose ends where a train could run off onto the floor. Identify a suitable uninformed search algorithm for this task and explain your choice. 	2	CO3	Ap
v)	Identify the criteria for measuring the performance of any search algorithms.	2	CO3	R
vi)	Illustrate forward chaining and backward chaining reasoning strategies by providing a practical example scenario for each strategy and discuss how they are applied to reach conclusions or make decisions.	2	CO4	U
vii)	Consider a scenario where a social media platform wants to recommend personalized content to its users based on their interests	2	CO5	Ap



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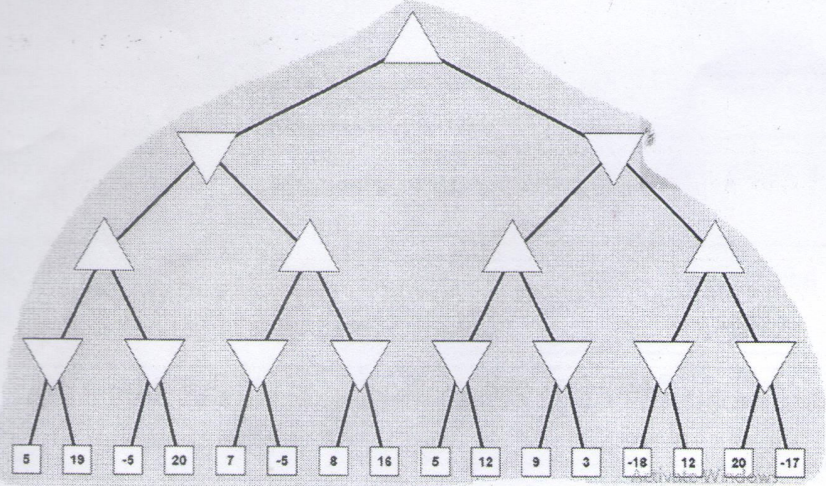
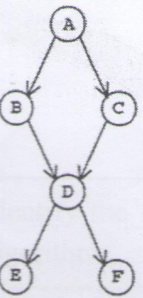
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	and preferences. Which type of learning approach—supervised learning or unsupervised learning would be more applicable for this task? Justify your choice.			
viii)	Write a hierarchical plan for planning a trip to Goa.	2	CO5	R
<b>Q.2</b>	<b>Solve any four questions out of six</b>	<b>16</b>		
i)	Formulate the following problem: Three missionaries and three cannibals are on one side of a river, along with a boat that can hold one or two people. Find a way to get everyone to the other side without ever leaving a group of missionaries in one place outnumbered by the cannibals in that place.	4	CO2	Ap
ii)	Summarize the categorization of intelligent system.	4	CO1	R
iii)	How AI is useful in daily life? Associate it to real life by giving 5 suitable examples.	4	CO6	Ap
iv)	 <p>Show how A* Search would create a search tree to find a path from the initial state to the goal state: At each step of the search algorithm, show which node is being expanded and the content of fringe(OPEN). Report the solution cost. Assuming the straight-line distance as the heuristics function: <math>h(S)=13</math>, <math>h(A)=7</math>, <math>h(B)=9</math>, <math>h(C)=11</math>, <math>h(D)=2</math>, <math>h(E)=4</math>, <math>h(F)=1</math> and <math>h(G)=0</math></p>	4	CO3	Ap
v)	Explain forward and backward chaining with example.	4	CO4	U
vi)	Explain Partial order planning with example.	4	CO5	U
<b>Q.3</b>	<b>Solve any two questions out of three.</b>	<b>16</b>		
i)	Explain Reinforcement learning with wrt types.	8	CO5	U



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ii)	Describe in detail Model based agent and Utility based agent.	8	CO2	U
iii)	Apply alpha-beta pruning on the example given below, consider the first node as max. 	8	CO3	Ap
<b>Q.4 Solve any two questions out of three.</b>		<b>16</b>		
i)	Explain role of NLP in Artificial Intelligence.	8	CO6	Ap
ii)	 Summarize Bayesian network to represent knowledge in uncertain domain. How many independent values are required to specify all the conditional probability tables (CPTs) for a given network?	8	CO4	Ap
iii)	Convert the following sentences into FOL. 1. Students like AI. 2. Students studies everything they like. 3. Gargi is a student. Prove by resolution "Gargi studies AI"	8	CO5	Ap