

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

Subject Code: EXDLC7031
Date: 8/12/2022

Subject Name: Artificial Intelligence

K. J. Somaiya Institute of Engineering and Information Technology, Sion, Mumbai-22

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End Semester Exam

Nov - Dec 2022

Program: B. Tech

Examination: LY Semester: VII | **EXTC**

Course Code: EXDLC7031 and Course Name: Artificial Intelligence

2:30

Duration: ~~03~~ 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
Q 1	Solve any six questions out of eight:	12		
i)	What do you mean by Intelligence? List the various components of AI Program	2	CO1	U
ii)	Analyze and provide a various environment type applicable for the following set of activities: • Playing soccer. • Deciding what item to take at hostel lunch.	2	CO2	U
iii)	Differentiate uninformed and informed search strategies. Which one is better and why?	2	CO3	U

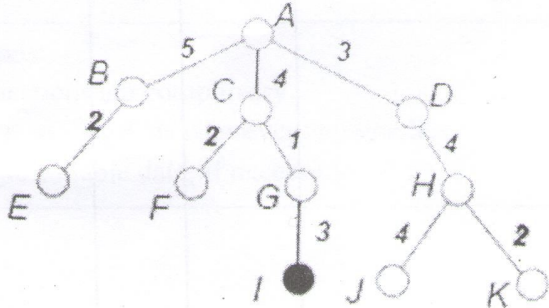
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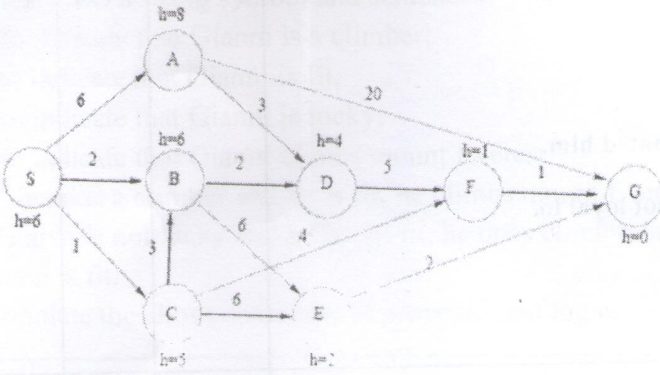
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iv)	Given the following symbol and sentences: C to indicate that Gianni is a climber; F to indicate that Gianni is fit; L to indicate that Gianni is lucky; E to indicate that Gianni climbs mount Everest; If Gianni is a climber and he is fit, he climbs mount Everest. If Gianni is not lucky and he is not fit, he does climb mount Everest. Gianni is fit. Formulate the above sentences in propositional logic.	2	CO3	A
v)	Define Uncertainty. Discuss the ways to handle uncertainty in the real-world problem statement.	2	CO4	U
vi)	Give the initial state, goal test, successor and cost function for Water Jug Problem. Consider you have a 4-gallon and a 3-gallon water jug and you need to get exactly 2 gallons in a 4-gallon jug.	2	CO4	U
vii)	Explain Markov property in Bayesian Belief network with an example.	2	CO5	U
viii)	Describe Problem solving agent. How to measure problem solving algorithms performance?	2	CO6	U
Q.2	Solve any four questions out of six.	16		
i)	Give the PEAS Description for an autonomous Mars Rover. Characterize its environment.	4	CO1	U
ii)	Explain State space graph representation. Draw the entire state space graph for three missionaries and cannibals' problem statement (include only legal states, that is, states in which cannibals do not outnumber missionaries on either side of the river)	4	CO2	U
iii)	Draw and describe the architecture of Utility based Agent. How it is different from Model based Agent?	4	CO3	U
iv)	Explain hierarchical planning to build a new house with a suitable diagram	4	CO4	U

	<p>Consider the following facts:</p> <ol style="list-style-type: none"> 1. Marcus was a man. 2. Marcus was a Pompeian. 3. All Pompeians were Romans. 4. Caesar was a ruler. 5. All Pompeians were either loyal to Caesar or hated him. 6. Everyone is loyal to someone. 7. People only try to assassinate rulers they are not loyal to. 8. Marcus tried to assassinate Caesar. <p>i) Represent the above facts into FOPL. ii) Convert into clause form.</p>	4	CO5	A
v	<p>Consider the graph given in Fig. below. Assume that the initial state is A and the goal state is I. Find a path from the initial state to the goal state using DFS. Also report the solution cost.</p> 	4	CO6	A
Q.3	Solve any two questions out of three.	16		
i)	Describe the Learning-based reflex Agents, its program along with its schematic diagram.	8	CO1	U

ii)	<p>Explain A* search and apply into the given figure below:</p> 	8	CO2	A
iii)	<p>Consider the following facts:</p> <ol style="list-style-type: none"> Marcus was a man. Marcus was a Pompeian. All Pompeians were Romans. Caesar was a ruler. All Pompeians were either loyal to Caesar or hated him. Everyone is loyal to someone. People only try to assassinate rulers they are not loyal to. Marcus tried to assassinate Caesar. <p>i) Represent the above facts into FOPL. ii) Convert into clause form.</p>	8	CO3	A
Q.4	Solve any two questions out of three.	16		
i)	<p>Apply forward and backward chaining to solve the given problem. "As per the law, it is a crime for an American to sell weapons to hostile nations. Country A, an enemy of America, has some missiles, and all the missiles were sold to it by Robert, who is an American citizen." Prove that "Robert is criminal."</p>	8	CO4	A
ii)	Sketch with a suitable example to describe the Belief Network	8	CO5	U
iii)	Define the steps of Problem formulation and describe the problem formulation steps for 4-Queens Puzzle problem statement.	8	CO6	A

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Q. 3 III) Explain forward chaining with example and stepwise diagram. 8M