

30/5/23

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

End Semester Exam

Apr – May 2023

(B.Tech/M.Tech.) Program: B. Tech

Examination: LY Semester: VII

Course Code: EXDLC7031 and Course Name: Artificial Intelligence

Duration: 03 Hours

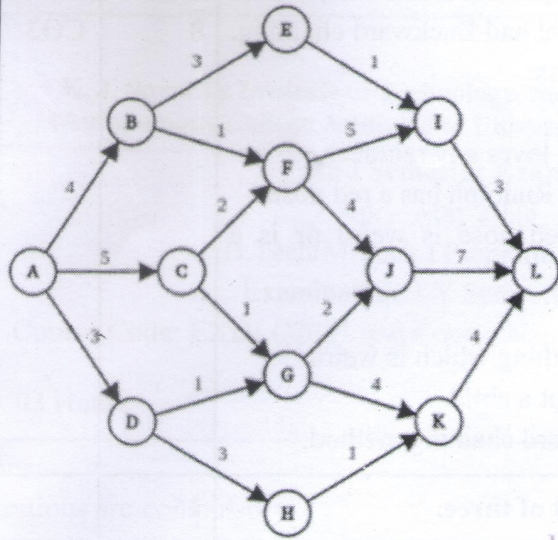
Max. Marks: 60

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)	Define Turing test. What would a computer need to pass a Turing Test?	2	CO1	U
ii)	Analyze and mention the types of environment variables applicable for Petrochemical Refining Process and Music Composing Mobile Application.	2	CO2	A
iii)	Differentiate between BFS and DFS. Which one is better and why?	2	CO3	U
iv)	Convert the given facts into FOL: <ul style="list-style-type: none"> • Every man respects his parents. • Not all students like both Mathematics and Science. 	2	CO3	A
v)	Explain uncertainty with respect to applications in healthcare.	2	CO4	U
vi)	Perform the Problem Formulation for the following case: Mouse is hungry, mouse is in a puzzle where there is some cheese. Mouse will only be satisfied, if the mouse eats cheese.	2	CO4	U

vii)	Discuss the advantages and limitations of Minmax algorithm	2	CO5	U
viii)	Consider a scenario of a tour organized with your friends. You will reach the destination but you'll want to enjoy the journey and this will remain as a good memory for the rest of your life. What type of Agent, you are acting like here? Justify the same with proper reasoning.	2	CO6	U
Q.2	Solve any four questions out of six.	16		
i)	Describe the PEAS descriptor for AI agent-based Airline Booking System.	4	CO1	A
ii)	Explain State space graph representation. Draw the State space representation for Towers of Hanoi using 3 disks.	4	CO2	U
iii)	Explain Learning based agent for disease prediction model with a suitable architecture.	4	CO3	U
iv)	Elaborate Conditional planning with neat diagram for a suitable example in the Education Sector.	4	CO4	U
v)	Apply resolution to resolve the given goal with proper steps. Consider the following knowledge base: <ol style="list-style-type: none"> 1. Gita likes all kinds of food. 2. Mango and chapati are food. 3. Gita eats almonds and is still alive. 4. Anything eaten by anyone and is still alive is food. Goal: Gita likes almonds.	4	CO5	A
vi)	A is the initial state and we always pick the lexicographically smallest state in case of a tie. If the goal state is L, find the order of exploration of states in DFS?	4	CO6	A



Q.3

Solve any two questions out of three.

16

i)

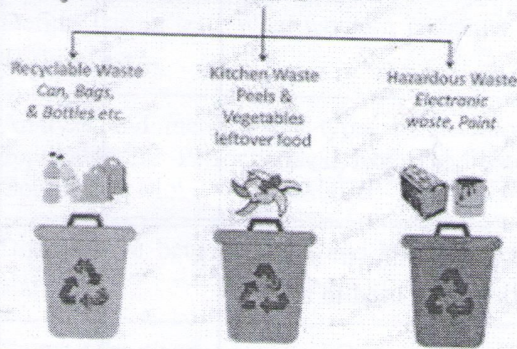
Identify the suitable agent to perform the given task as shown in the below figure. And describe the agent with an appropriate schematic diagram.

8

CO1

U

Waste Segregation



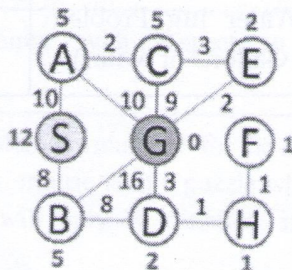
ii)

Explain A* search and Solve using A* Search algorithm to find the optimal path cost and space complexity.

8

CO2

U



<p>iii)</p>	<p>Differentiate between Forward and Backward chaining. Consider the following axioms:</p> <ol style="list-style-type: none"> 1. Every child loves Santa. 2. Everyone who loves Santa loves any reindeer. 3. Rudolph is a reindeer, and Rudolph has a red nose. 4. Anything which has a red nose is weird or is a clown. 5. No reindeer is a clown. 6. Scrooge does not love anything which is weird. 7. (Conclusion) Scrooge is not a child. <p>Solve by forward and backward chaining method.</p>	<p>8</p>	<p>CO3</p>	<p>U</p>
<p>Q.4</p>	<p>Solve any two questions out of three.</p>	<p>16</p>		
<p>i)</p>	<p>Explain Adversarial Search algorithm. How many nodes would be pruned out and find the values of node A, B, C, D using Adversarial Searching algorithm? Assume we explore the nodes in lexicographical order.</p> <div style="text-align: center;"> </div>	<p>8</p>	<p>CO4</p>	<p>U</p>
<p>ii)</p>	<p>Explain the Bayesian Belief network with a suitable example. How the Bayesian network can be used to answer any query?</p>	<p>8</p>	<p>CO5</p>	<p>U</p>
<p>iii)</p>	<p>Describe the goal formulation steps for the Water Jug Problem and Identify the correct sequence of production rules to implement Water Jug Problem (Goal State: Fill any one jug with 2 Gallons of water)</p>	<p>8</p>	<p>CO6</p>	<p>U</p>