VI/CO/AI 22 MAY 2024

RAMRAO ADIK INSTITUTE OF TECHNOLOGY, NERUL

(D Y Patil Deemed to be University)

Program: Computer Engineering
End Semester Examination: B.Tech. Semester VI
Course Code: CECDLO6042 Course Name: Artificial Intelligence
Time: 2 hour **Max. Marks: 60**

Instructions: 1. All three questions are compulsory and assume suitable data is required

Que. No.	Question	Max. Marks	CO	BT
Q1	Solve any **Four**			
i)	What is State Space Search and give steps for state space search in detail	5	CO1	BT3
ii)	Explain Bi-directional search and justify its advantages over other uniformed search using application.	5	CO2	BT5
iii)	Explain greedy search algorithm with its applications	5	CO3	BT2
iv)	Explain the steps involved in converting the propositional logic statement into CNF with a suitable example	5	CO4	BT2
v)	Explain fuzzification method with example in detail.	5	CO5	BT2
vi)	What is Plan? Explain Hierarchical Planning in detail	5	CO6	BT3

Que. No.	Question	Max. Marks	CO	BT
Q2 A	Solve any **Two**			
i)	Write state space representation for 8 puzzle problem with flow diagram and equations.	5	CO2	BT2
ii)	Explain various methods of knowledge representation technique.	5	CO4	BT2
iii)	List out all Structure of Agents and give details of any one structure in detail with diagram.	5	CO1	BT2
iv)	For following fuzzy set find out given set is normal? Find out height, support, core and cardinality of it. $M=\left\{\frac{0.37}{a}+\frac{0.5}{b}+\frac{1}{d}+\frac{0.86}{e}\right\}$	5	CO5	BT4
Q 2 B	Solve any **One**			
i)	Consider the search problem below with start state S and Goal state G. The transition cost are next to the edges and the heuristic values are as shown in the table. Calculate the final cost using A * search algorithm.	10	CO3	BT5

State	S	A	B	C	D	E	F	G
h(n)	6	8	6	5	4	2	1	0

Table : Heuristic Values – Straight line distance to G

VI/ CO/ AI 22 MAY 2024 (275)

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	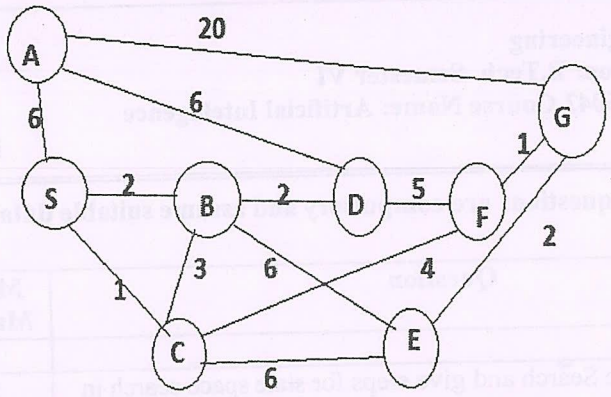			
ii)	You are given two jugs with measuring marks, a 4-gallon one and a 3-gallon one. There is a pump to fill the jugs with water. How can you get exactly 2 gallons of water into the 4- gallon jug? For the agent of water jug, develop a state space description.	10	CO2	

Que. No.	Question	Max. Marks	CO	BT
Q3	Solve any **Two**			
i)	Using Game theory "Tic Tac Toe" explain Min –Max Search?	10	CO3	BT4
ii)	For each of the following activities, give a PEAS description of the task environment. 1. Shopping for used AI books on the Internet. 2. Self-driving car	10	CO1	BT6
iii)	U=Flowers= {Jasmine(J), Rose(R), Lotus(L), Daffodil(D), Sunflower(S), Hibiscus(H), Chrysanthemum(C)}. Be the universe on which two fuzzy sets one for beautiful flowers and other for fragrant flowers are defined as shown in below, P=Beautiful flowers= $M=\left\{\frac{0.3}{J}+\frac{0.9}{R}+\frac{1}{L}+\frac{0.76}{D}+\frac{0.5}{S}+\frac{0.4}{H}+\frac{0.6}{C}\right\}$ Q= Fragrant flowers= $\left\{\frac{1}{J}+\frac{1}{R}+\frac{0.5}{L}+\frac{0.2}{D}+\frac{0.2}{S}+\frac{0.1}{H}+\frac{0.4}{C.}\right\}$ Compute fuzzy sets $P\cup Q, P\cap Q, P', Q', P-Q, P\otimes Q$ *Verify* $P\cup P'\neq U, P\cap P'\neq \Phi$	10	CO5	BT6

Course Outcomes (CO) -Learner will be able to:

CO1: Develop a basic understanding of AI building blocks presented in intelligent agents.
CO2: Choose an appropriate problem solving method and knowledge representation technique.
CO3: Analyse the strength and weakness of AI approaches to knowledge-intensive problem solving..
CO4: Design the reasoning models to handle uncertainty information.
CO5: Analyse different planning problems and learning concepts.
CO6: Design and develop AI applications in real world scenarios.

BT1- Remembering, BT2- Understanding, BT3- Applying, BT4- Analyzing, BT5- Evaluating, BT6- Creating