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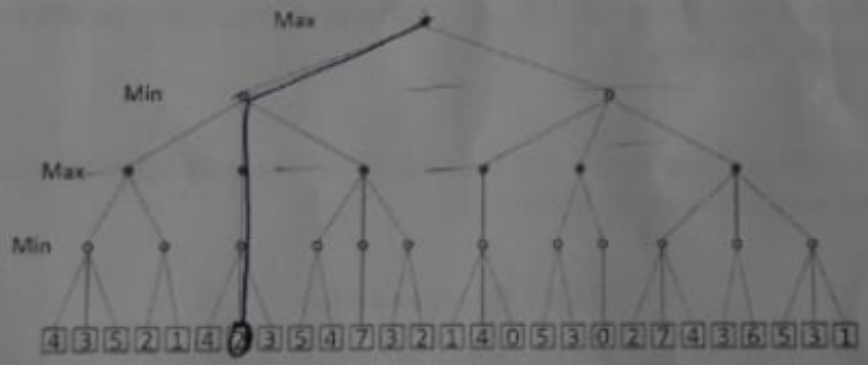
TERM END EXAMINATIONS (TEE) – May 2024

Programme	:	**B.Tech.**	**Semester**	:	**Winter Semester 2023-2024**
Course Title/ Course Code	:	Fundamentals in AI & ML/ **CSA2001**	**Slot**	:	**A21+A22+A23**
Time	:	**3 Hrs.**	**Max. Marks**	:	**100**

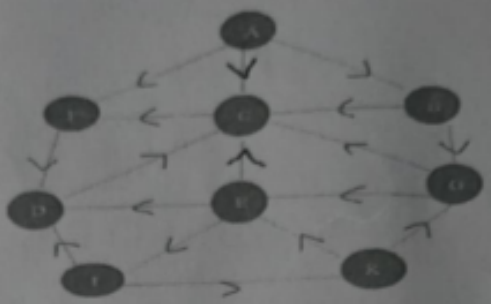
Answer ALL the Questions

Q. No.		Question Description	Marks
		PART A – (60 Marks)	
1	(a)	Consider an automatic vacuum cleaner robot used in households. What are the PEAS components needed for it? Also, how do you estimate its performance?	12
		OR	
	(b)	Describe the Model-based reflex agents, Goal-based agents, Utility-based agents.	12
2	(a)	Describe the MiniMax algorithm. Also, compare the advantages, benefits, and drawbacks of the algorithm. Write down a step-by-step procedure to find the optimal move using the following tree: Which move would you make as MAX considering that your opponent also plays optimally?	12



OR

	(b)	Apply the Depth First search traversing algorithm and find the sequence of elements in the path.	12



3 (a) Convert the following sentences to the FOPL. 12

a. Every man respects his father.
b. Some girls play badminton.
c. Not all boys like both Biology and Physics.
d. All birds can fly and few birds can run.
e. Not all kings wear a crown.

OR

(b) Explain propositional logic. List out all the symbols of propositional logic with an example. How is predicate logic better than propositional logic. 12

4 (a) How do you represent knowledge across agents? Does communication between agents increase the individual agents' knowledge? How is the inference from the communication added as a knowledge component? 12

OR

(b) In a multiagent system, how does interaction between the agents happen? And explain the use of the agent's coordination, negotiation, and cooperation. 12

5 (a) Describe linear discriminant analysis (LDA) with the necessary equations and possible projection lines. 12

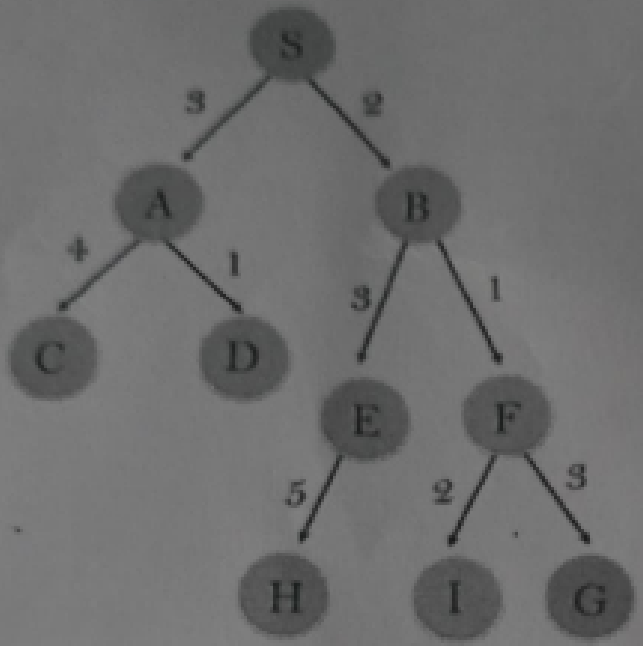
OR

(b) Discuss the six decisions needed to be made to build a good approximation in a supervised machine learning algorithm. 12

PART B – (40 Marks)

6 Explain how intelligent agents perceive their environment and make decisions based on the acquired information with a suitable example. 8

7 Explain the BFS algorithm with pseudocode. Find the most cost-effective path to reach from start state S to final state G using the BFS algorithm. 8



node	H (n)
A	12
B	4
C	7
D	3
E	8
F	2
H	4
I	9
S	13
G	0

8. Convert the following sentences into First Order Predicate Logic: 8 marks

1. Coconut-crunchy is a biscuit.
2. Mary is a child who takes coconut-crunchy.
3. John loves children who take biscuits.
4. John loves Mary.

9. Explain in detail, the applications of mobile agents. 8 marks

10. Analyze about the regression problem in statistics for supervised learning. 8 marks