21/12

Code No.: (R22CS503PC)

R22	H.T.No.			8	R					

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
III–B.TECH–I–Semester End Examinations (Regular) - December- 2024
ARTIFICIAL INTELLIGENCE
(Common for CSE, IT, CSD)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks.

PART-A **(10 Marks)**

1. a)	List out the Problem formulation steps in AI.	[1M]
b)	Differentiate uninformed and informed search strategies.	[1M]
c)	State about Evaluation functions.	[1M]
d)	Define Constraint Graph.	[1M]
e)	Illustrate First Order Logic Programming.	[1M]
f)	Why is Skolemization required in first-order resolution?	[1M]
g)	Mention two applications of Ontological Engineering.	[1M]
h)	State the rule for partial order planning.	[1M]
i)	Analyze the causes of uncertainty.	[1M]
j)	Outline the need of probabilistic reasoning in AI.	[1M]

PART-B **(50 Marks)**

2.a)	Differentiate between a Goal-based agent and Utility-based agent with the help of agent architectures.	[5M]
b)	Discuss the working pattern of Iterative deepening Depth First Search with the help of an algorithm.	[5M]

OR

3.	Write the A* search algorithm. Apply A* heuristic search strategy for the graph given below to find the shortest path from Initial State S to Goal State G. The heuristic values from each node to the Goal node are given in the table below,	[10M]

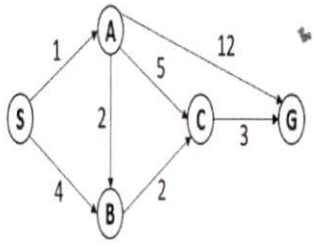

Fig.1

State	S	A	B	C	G
Heuristic	7	6	2	1	0

4.a)	Demonstrate Minmax game playing algorithm with example.	[6M]
b)	Outline the effectiveness of alpha-beta pruning.	[4M]

OR

5.a)	Given a CSP (constraint satisfaction problem), SEND+MORE=MONEY, choose a value for each variable so that the resulting possible world satisfies the constraints; describe the model of the constraints.	5M]
b)	Explain about Horn clauses and definite clauses.	[5M]

6. Consider the following sentences, [10M]
John likes all kinds of food.
Apples are food.
Chicken is food.
Anything anyone eats and isn't killed by is food.
Bill eats peanuts and is still alive.
Sue eats everything Bill eats.
i) Translate these sentences into formulas in predicate logic.
ii) Convert the formulas into clause form.
iii) Prove that John likes peanuts using resolution.

OR

7.a) Explain Unification algorithm in detail. [4M]
b) What is Backward Chaining? Explain with an example. [6M]

8.a) What is Ontological Engineering? Explain with the diagram the upper ontology of the world. [6M]
b) Define situation calculus? Demonstrate the ontology of situation calculus. [4M]

OR

9.a) Demonstrate planning and acting in nondeterministic domains. [5M]
b) Outline Graph Plan algorithm in detail. [5M]

10.a) Discuss about Acting under uncertainty. [4M]
b) What is a Basic probability notation Bayes rule? Explain with an example. [6M]

OR

11.a) Discuss about Approximate Inference in Bayesian Networks. [5M]
b) Explain Dempster-Shafer theory. [5M]

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