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Question Paper Code	12392
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**B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2023**  
Fourth Semester  
**Artificial Intelligence and Data Science**  
(Common to Third Semester - Computer Science and Engineering (AIML))  
**20AIPC401 - FUNDAMENTALS OF ARTIFICIAL INTELLIGENCE**  
(Regulations 2020)

Duration: 3 Hours

Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

- |   | <i>Marks,<br/>K-Level, CO</i> |
|---|-------------------------------|
| 1. Identify a PEAS description for Student Bot.                       | 2,K1,CO1                      |
| 2. List the criteria to measure the performance of search strategies. | 2,K1,CO1                      |
| 3. Define Constraint Satisfaction Problem.                            | 2,K1,CO2                      |
| 4. What is Local Maxima?  | 2,K1,CO2                      |
| 5. What are categories and objects?                                   | 2,K1,CO4                      |
| 6. How Knowledge is represented?                                      | 2,K2,CO4                      |
| 7. Write down four actions for changing a flat tire problem.          | 2,K2,CO5                      |
| 8. Differentiate Progression and Regression.                          | 2,K2,CO5                      |
| 9. Define robot perception.   | 2,K1,CO6                      |
| 10. Draw a figure showing robot's perception.                         | 2,K2,CO6                      |

**PART - B (5 × 13 = 65 Marks)**

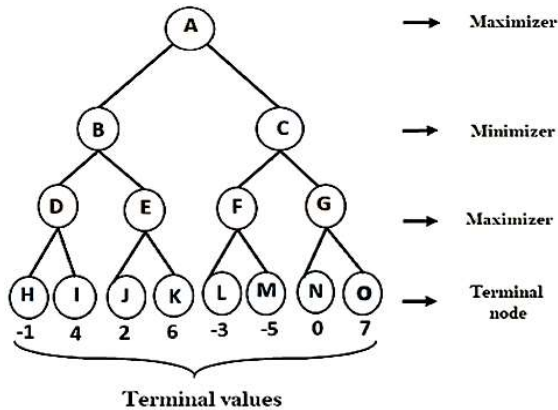
Answer ALL Questions

11. a) Discuss in detail about the different types of Intelligent Agent with a neat diagram and also detail about any two agent programs for any type of agent. 13,K1,CO1

**OR**

- b) Discuss in detail about the following problem-solving approaches to AI problems with examples. 7,K1,CO1
- (i) 8-puzzle problem. 6,K1,CO1
- (ii) Water jug problem.

12. a) Solve the below game tree problem by using minimax algorithm. 13,K3,CO2



Terminal values  
OR

- b) Explain the concepts of the following with example  
 (i) Bidirectional Search, Uniform Cost Search  
 (ii) Depth First Search.

8,K2,CO2  
5,K2,CO2

13. a) Explain mental events and mental objects in detail.

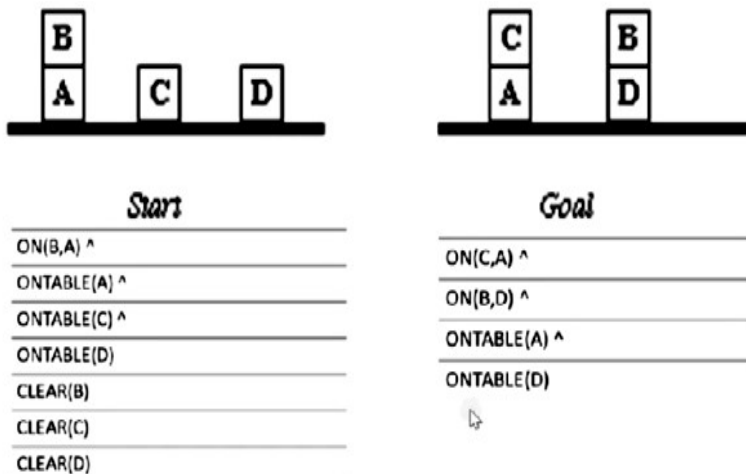
13,K2,CO4

- b) (i) Discuss the steps associated with the Knowledge Engineering process.  
 (ii) Outline the concept of semantic networks in detail.

7,K2,CO4  
6,K2,CO4

14. a) Explain the logic with step in Goal stack problem.

13,K3,CO5



OR

- b) Identify a POP algorithm for the sequence of events in changing a flat tire problem.

13,K2,CO5

15. a) Describe Natural Language Processing and its applications in detail.

13,K2,CO6

OR

- b) Demonstrate the model of ROBOT with its hardware and perception in detail with neat diagram.

13,K2,CO6

**PART - C (1 × 15 = 15 Marks)**

16. a) (i) Describe backward chaining with algorithms in first order logic with relevant examples. *7,K2,CO3*  
(ii) Explain Map coloring problem with 5 southern states of India. Viz: Tamil Nadu, Kerala, Telangana, Andhra Pradesh and Karnataka *8,K2,CO3*

**OR**

- b) Explain the logic in crypt arithmetic problem for the below Problem:  
No two letters have the same value. The sums of the digits must be shown in the problem

(i)	(ii)	<i>8,K3,CO3</i>
SEND	BASE	
+MORE	+ BALL	<i>7,K3,CO3</i>
.....	.....	
MONEY	GAMES	