



- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Assume suitable data whenever necessary.

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|----|------|--|---|
| 1. | a) | What is Turing Test? Explain the purpose of Turing test. | 5 |
| | b) | Explain the problem characteristics for solving following AI problems: (any two) | 8 |
| | i) | Water-Jug problem | |
| | ii) | Chess playing | |
| | iii) | 8 puzzle problem. | |

OR

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|-----------|--|----------|
| 2. | a) Give the state space representation of the water-jug problem and give one solution to it. | 6 |
| | b) What do you mean by production systems? State its different types and explain each of the types in brief. | 7 |
| 3. | a) Write and explain AO* Algorithm. | 7 |
| | b) Explain constraint satisfaction problem with respect to the cryptarithmic problem given below:- | 7 |

$$\begin{array}{r} \text{SEND} \\ + \text{MORE} \\ \hline \text{MONEY} \end{array}$$

OR

- | | | | |
|-----------|-----|--|----------|
| 4. | a) | Write algorithm mean-ends Analysis MEAN (CURRENT, GOAL) for Robot navigation for same, mention the robot operators and difference table. | 7 |
| | b) | What is the need of unification Algorithm? Explain unification algorithm | 7 |
| 5. | a) | Construct partitional semantic nets for the following. | 8 |
| | i) | Every batter hits a ball | |
| | ii) | All the batters like the pitcher. | |
| | b) | List the various approaches for knowledge representation in AI. Discuss the issues related to it. | 5 |

OR

6. a) Represent the following statement in predicate logic 8
- i) The owner of a car also owns the boat.
 - ii) All people need entertainment.
 - iii) Everyone is loyal to someone.
 - iv) John likes all kinds of foods.
- b) Give resolution principle, also write resolution algorithm in Predicate logic. 5

7. a) Write a short note on RTN and ATN. 7
- b) Write a script to represent the scenario created for following:- "Online shopping for books from www. Amazon. com" 7

OR

8. a) State various types of learning methods and explain any three with examples. 6
- b) Construct a parse tree for the sentence given below "Gita saw a dog in the market". Use the following rules or add some rules it required. 8

$S \rightarrow NP \ VP$ $N \rightarrow \text{Gita} / \text{dog} / \text{market}$
 $NP \rightarrow N$ $V \rightarrow \text{Saw} / \text{run}$
 $VP \rightarrow V \ NP$ $PREP \rightarrow \text{in} / \text{with}$
 $NP \rightarrow \text{DET} \ N \ PP$
 $PP \rightarrow \text{PREP} \ NP$
 $NP \rightarrow \text{DET} \ N$
 $\text{DET} \rightarrow \text{a} \mid \text{am} \mid \text{the}$

9. a) What do you mean by expert system? Draw the architecture of expert system and explain the purpose of each component involved in it. 7
- b) Explain the following:- 6
- i) Knowledge engineering process
- ii) Expert system shell.

OR

10. a) Explain in detail about the development phases of expert system life cycle. 6
- b) Differentiate the following pairs 7
- i) Database versus knowledge base.
- ii) Conventional system versus expert system.
11. a) What are the sources of uncertainty? 6
- b) Explain how Baye's theorem and probability can be used to handle uncertainty. 7

OR

12. a) Explain fuzzy logic and its application. 6
- b) What do you mean by certainty factor? How we can find the CF for proving certainty of any hypothesis? 4
- c) How fuzzy set is different from crisp set? 3
