

(3 Hours)

[ Total Marks : 100 ]

- N.B.: (1) Question No. 1 is compulsory  
 (2) Write any four questions out of remaining.  
 (3) Assume suitable data if required.

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|---|-----|---|----|
| 1 | (a) | Explain robot workspace.  | 5  |
|   | (b) | Explain steps to convert Logical statements into Casual Normal Form.              | 5  |
|   | (c) | List and define kinetic parameters.   | 5  |
|   | (d) | What is planning problem? How it differs from search problem?                     | 5  |
| 2 | (a) | Explain A* algorithm with example. What is the drawback of A*?                    | 10 |
|   | (b) | What is Uncertainty? How probability theory can be applied for toothache problem? | 10 |
| 3 | (a) | Explain various methods of knowledge representation with example.                 | 10 |
|   | (b) | Explain Hill-Climbing Algorithm with its limitations.                             | 10 |
| 4 | (a) | Obtain Direct Kinematic solution for 4-axis SCARA Robot.                          | 10 |
|   | (b) | Describe the following sensors-<br>i) Sonar                      ii) Infrared     | 10 |
| 5 | (a) | List and explain steps in designing the reactive behavioural system.              | 10 |
|   | (b) | Explain supervised, unsupervised and reinforcement learning with example.         | 10 |
| 6 | (a) | Explain learning agent with diagram. Also explain inductive learning?             | 10 |
|   | (b) | Describe different types of environments applicable to AI agents.                 | 10 |
| 7 |     | Write short note on   | 20 |
|   | (a) | PEAS Descriptor   |    |
|   | (b) | BFS   |    |
|   | (c) | PROLOG  |    |
|   | (d) | Uniform Search  |    |