

- N.B. 1. Question No. 1 is compulsory
 2. Attempt any **three** questions from remaining five questions
 3. Assume suitable data if **necessary** and justify the assumptions
 4. Figures to the **right** indicate full marks

- Q1 A Explain BFS and DFS with proper example and performance measures. 05
 B Explain supervised and unsupervised learning with proper block diagram. 05
 Q1 C Define universal and Existential quantifiers. Represent the following sentence in predicate form "All the children like chocolates". 05
 D Explain simple reflex agent with the help of neat diagram. 05
- Q2 A List different types of environments and explain environment types for car driving, part picking robot, cross word puzzle and Soccer game applications. 10
 B Why is the PEAS descriptor important in the design and analysis of intelligent agents? How does it aid in understanding agent behavior? 10
- Q3 A Compare informed and uninformed search in terms of parameters using knowledge, performance, completion, cost factor, time, direction implementation, efficiency, computational requirements, size of search problem 10
 B Explain the A* search algorithm with an example. 10
- Q4 A Explain Vacuum World Problem with proper State space representation. 10
 B Consider following axioms. 10
 All people who are graduating are happy.
 All happy people smile.
 Someone is graduating.
 i) Represent these axioms in FOL.
 ii) Convert each formula to CNF.
 iii) Prove that someone is smiling using resolution technique. Draw the resolution tree.
- Q5 A What is a rational agent? State and express the concept of rationality. 10
 B Describe each component in the architecture of expert system? What are the limitations of expert system? 10
- Q6 A Explain concept of supervised, unsupervised, semi-supervised and reinforcement learning with example 10
 B What is simulated annealing? How is it inspired by the physical process of annealing in metallurgy? Describe the acceptance criteria used in simulated annealing. How does the algorithm decide whether to accept a new solution? 10