

Time (3 hours)

Total Marks: 80

- 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 Write down the importance and properties of knowledge representation system. 05  
B Differentiate between Supervised and unsupervised learning. 05  
C What is heuristic function? Explain how we can consider heuristic value of 8-puzzle problem. 05  
D Explain Model-based agent with neat diagram. 05
- Q2 A What is uncertainty. Consider any example, draw and explain a Bayesian network with suitable probability tables. 10  
B Explain PEAS descriptor for a part picking robot. Explain how percept sequence is generated. 10
- Q3 A Differentiate between informed search and uninformed search techniques. Also explain A\* algorithm with the help of an example. 10  
B What is Prolog? What do you mean by Structure in prolog? Write a Prolog program for family information systems. 10
- Q4 A Explain alpha-beta pruning algorithm with the help of an example. 10  
B Consider the following sentences: 10  
i. Vertebrates drink water.  
ii. Man is mortal.  
iii. Man is vertebrates.  
iv. Marcus is Man.  
Prove Marcus is mortal using Resolution.

- Q5 A With an example explain all the steps required to convert FOPL into CNF. 05  
B Explain general model of learning agent with suitable example. 05  
C Explain backward chaining with the help of example 05  
D Write a note on Reinforcement learning. 05
- Q6 A Explain Genetic algorithm with suitable example. 10  
B Formulate state space search problem for vacuum world cleaner. 10
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