

Total No. of Questions : 12]

SEAT No. :

**P796**

[Total No. of Pages : 4

**[4659] - 208**

**B.E. (Information Technology) (Semester - I)**

**ARTIFICIAL INTELLIGENCE (Elective - I (b))**

**(2008 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) Answers to the TWO sections should be written in separate sheet.*
- 2) Neat diagram must be drawn wherever necessary.*
- 3) Figures to the right indicates full marks.*
- 4) Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Define Artificial Intelligence? Explain how Artificial Intelligence plays role in design of Intelligent Agents? **[8]**
- b) What is the need of PEAS description of the task environment? Develop a PEAS description for the following task environments. **[8]**
- i) A computer program that given an image of a fingerprint can find the best match in a database of criminal fingerprints
  - ii) Robot Soccer Player
  - iii) A software agent that can play a computerized version of the following traditional game of solitaire

OR

- Q2)** a) Explain ant colony optimization and particle swarm optimization in brief. Explain their applications. **[8]**
- b) Explain structure of Utility Based Agent and Goal Based Agent and compare them. **[8]**

**P.T.O.**

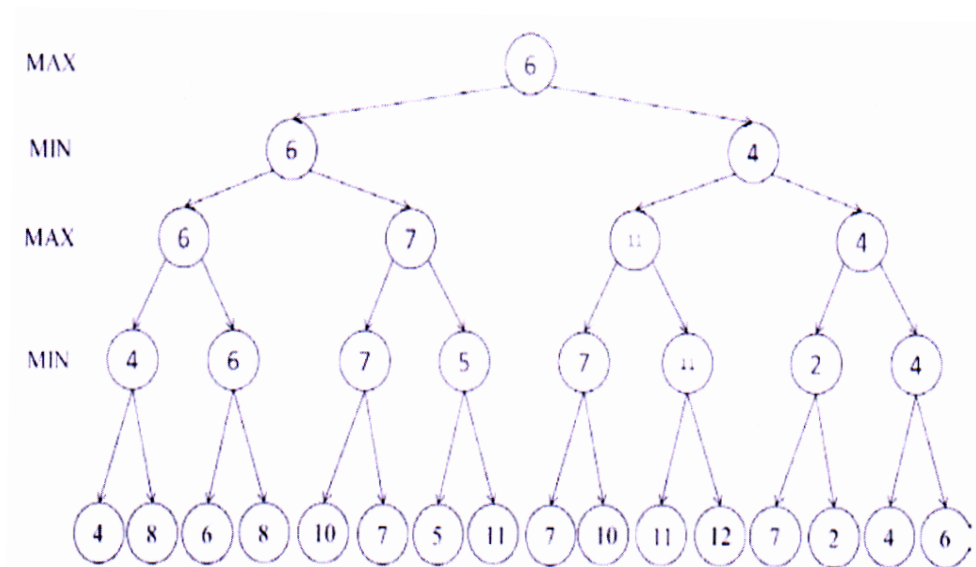
**Q3) a)** What is heuristics? Explain with example. Also write heuristic function for Tic-Tac toe and Travelling salesman problem. [8]

b) Describe graph coloring problem as a Constraint Satisfaction Problem. Explain how 'minimum remaining values' heuristic helps in ordering the variable values. [8]

OR

**Q4) a)** How to solve problem using state space search? Analyze water-jug problem as state space search. [8]

b) Explain Min-max search procedure. Use the Minimax algorithm to compute the minimax value at each node for the game tree below. [8]



**Q5) a)** “If it is hot, then it is humid. If it is humid then it will rain. It is hot.” Show that “It will rain.” Using resolution, Find its clausal form and draw its tree. [9]

b) Describe semantic nets and frames with suitable examples. Construct semantic net representation of the following. ‘Rajesh is Indian, Rajesh is a lecturer.’ [9]

OR

**Q6) a)** Explain the following steps in NLP with suitable examples. [9]

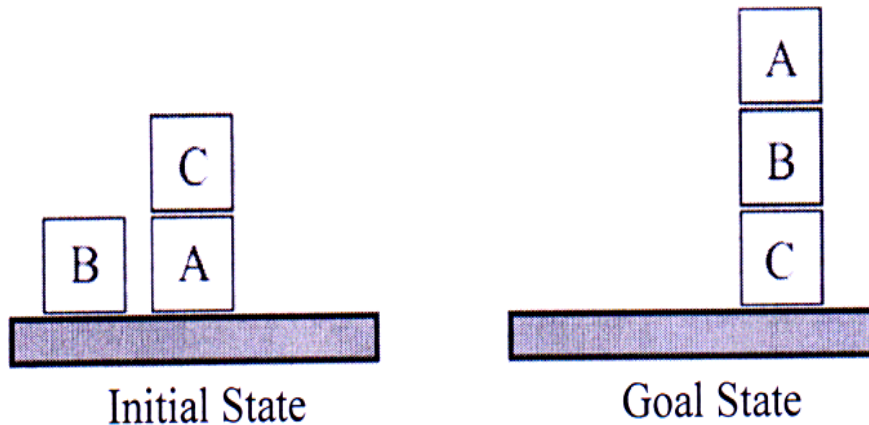
i) Discourse Integration

ii) Pragmatic analysis

b) What is Uncertainty? Also explain logic for Non-monotonic reasoning. [9]

## SECTION - II

- Q7)** a) What is planning? Describe shortly what the “Strategy of Least Commitment” means and in which way it is used in Planning. [9]
- b) What is “Sussman anomaly” in block world problem? Consider the following block world problem. Represent the start state and goal state using STRIPS type of operators. Using goal stack planning process, what will be the initial goal stack? What operators will be used to achieve the first goal? Specify its preconditions. [9]



OR

- Q8)** a) What are different components of a planning system? Explain. Also describe hierarchical planning in brief. [9]
- b) How 3-dimensional information is recovered using shading, contour and texture gradients. Explain in detail. [9]
- Q9)** a) What is Supervised Learning and unsupervised Learning? Explain the benefits of Neural Networks. [8]
- b) Write main features of an expert system. Explain expert system shell. [8]

OR

- Q10)** a) Explain the basic approach that Winston’s learning program used for concept formation. [8]
- b) Describe general framework for explanation based learning programs and give the general learning algorithm. [8]

**Q11)a)** Explain each of the following constructs in PROLOG. Give suitable example of each. **[8]**

- i) Relational operators
  - ii) Built-in data types
  - iii) Facts
  - iv) Rules
- b) Explain in brief three main sections for writing PROLOG program. **[8]**

OR

**Q12)a)** What is the system predicate CUT? Discuss the importance use of CUT in Prolog. **[8]**

- b) Write a short on coordination and cooperation in distributed reasoning systems. **[8]**

