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**Artificial Intelligence**

P. Pages : 2

Time : Three Hours

**NKT/KS/17/7406**

Max. Marks : 80

- 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. Due credit will be given to neatness and adequate dimensions.
  9. Assume suitable data whenever necessary.
  10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) What is AI ? Explain the task domains of AI. 8
- b) Discuss AI technique in detail. 5

**OR**

2. a) Discuss the role of production system in problem solving system. 5
- b) Explain different problem characteristics in detail. 8
3. a) Explain Steepest - Ascent Hill climbing in detail with example. 8
- b) Write a note on Best-First search. Also explain the use of OR Graphs. 6

**OR**

4. a) Trace the constraint satisfaction procedure solving the following cryptarithmic problem. 8
- CROSS  
+ ROADS  
-----  
DANGER
- b) Show how means-end analysis could be used to solve the problem of getting from one place to another. Assume that the available operators are walk, drive, take the bus, take a cab, and fly. 6
5. a) Explain with neat diagram the mapping between facts and representations. 6
- b) Write a note on inheritable knowledge. 7

**OR**

6. Consider the following sentences :
- i) John likes all kinds of food.
  - ii) Appels are food.
  - iii) Chicken is food
  - iv) Anything anyone eats and isn't killed by is food.
  - v) Bill eats peanuts and is still alive.
  - vi) Sue eats everything Bill eats.
- I. Translate these sentences into formulas in predicate logic. 6
- II. Prove that John likes peanuts using resolution. 7
7. a) Write a note on nonmonotonic reasoning. 7
- b) Write a note on Bayesian Network. 6
- OR**
8. a) Discuss Baye's Theorem of probability in detail. 7
- b) Explain the significance of certainty factor in designing rule based system. 6
9. a) What is learning ? Explain Rote learning technique in detail. 7
- b) Explain Winston's learning program in detail. 6
- OR**
10. a) Write a note on Explanation Based Learning. 7
- b) Discuss learning by Analogy. 6
11. a) With the help of neat block diagram explain different components of an expert system 10
- b) Write a note on Decision Tree Architecture. 4
- OR**
12. a) Give and explain the characteristic features of Expert systems. Also state its application. 8
- b) Illustrate knowledge engineering process with the help of block diagram. 6

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~ Mark Twain

