

Name :

Roll No. :

Invigilator's Signature :

CS/M.Tech (ECE)/SEM-2/MECE-205/2010
2010
ARTIFICIAL INTELLIGENCE

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer any *five* questions. 5 × 14 = 70

1. a) What is intelligence ? How does it vary from human's intelligence ?

 b) Explain the role of agents in AI domain.

 c) Write short notes on Dependency directed back tracing.

1 + 3 + 6 + 4

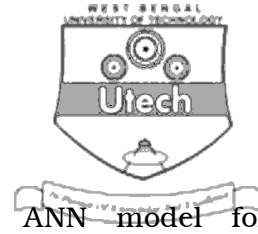
2. a) Prove each of the following statements :

 i) Breadth first search is a special case of uniform cost search.

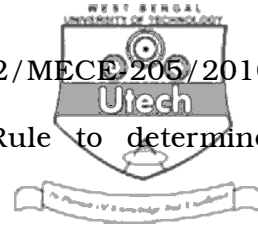
 ii) Uniform cost search is a special case of A* search.

 b) Discuss different models for non-monotonic reasoning.

4 + 4 + 6



3. a) Define an ANN.
- b) What is classifier ? Discuss an ANN model for classification of multidimensional data into two classes.
- c) Explain different types of learning. 3 + 2 + 3 + 6
4. a) What do you mean by a perception ?
- b) Critically compare between single layer perception and multi-layer perception.
- c) Explain the functioning of Kohonen self-organizing in network. 3 + 4 + 7
5. a) Compare a fuzzy set with a crisp set. Supplement your answer with a few applications.
- b) Let A and B be fuzzy sets defined on universe of discourse X. Prove that
- i) $(A \cap B)^c = A^c \cup B^c$
- ii) $(A \cup B)^c = A^c \cap B^c$
- c) Test whether, $((P \Rightarrow Q) \wedge (Q \Rightarrow P)) = \neg Q \wedge P$ is a tautology or not ? 2 + 2 + 3 + 3 + 4
6. a) Derive the generalized Delta Learning Rule.
- b) Form a Madaline network for XOR function with bipolar input and targets using MRI algorithm. 5 + 9



7. a) Apply the Fuzzy Modus Ponens Rule to determine
Rotation is quite slow given

- i) if the temperature is high then the rotation is slow
- ii) the temperature is very high.

Let $\bar{H} = \{ \text{High} \}$, $\overline{VH} = \{ \text{Very High} \}$, $\bar{S} = \{ \text{Slow} \}$
and $\overline{QS} = \{ \text{Quite Slow} \}$ Indicate the associated
fuzzy sets as follows :

For $X = \{ 30, 40, 50, 60, 70, 80, 90, 100 \}$ the set of
temperatures and $Y = \{ 10, 20, 30, 40, 50, 60 \}$, the
set of rotations per minute,

$$\bar{H} = \{ (70, 1), (80, 1), (90, 0.3) \}$$

$$\overline{VH} = \{ (90, 0.9), (100, 1) \}$$

$$\bar{S} = \{ (10, 1), (20, 0.8) \}$$

$$\overline{QS} = \{ (30, 0.8), (40, 1), (50, 0.6) \}$$

- b) Distinguish between Predicate Logic and Propositional
Logic with respect to their inferences. 9 + 5
