Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

MCSE-205

M.E./M.Tech., II Semester

Examination, December 2016

Soft Computing

Time : Three Hours

Maximum Marks : 70

Note : i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Write and explain the algorithm for Minimax Search algorithm? What is alpha beta cut off?
   b) What are heuristic search techniques? Explain Hill climbing algorithm with the help of an example what are the problems associated with hill climbing?

2. a) What do you understand by computational intelligence? Briefly explain its characteristics and applications?
   b) Explain the working of Bayesian belief Network? Also state its advantages and disadvantages.

3. a) Given a two input neuron with the following weight matrix and input vector : W = [3, 2] and P = $[-5, 7]^T$ we would like to have an output of 0.5.
      i) Is there a bias that will do the job if the linear transfer function is used? If yes what it is?
      ii) Is there a bias that will do the job if a log sigmoid transfer function is used? What is it?
   b) What is supervised and unsupervised learning? Explain one method of each of them?

4. a) Draw and explain the architecture of counter propagation network? How it works in normal and training mode?
   b) What is hopfield neural network? What is the stability constraint associated with it?

5. a) Explain the algorithm of support vector machine. What are the issues associated with support vector machines?
   b) Explain ART with respect to the following :
      i) Architecture
      ii) Training

6. a) Two fuzzy sets are defined in the image processing system to recognize English alphabet (F, E, X, Y, I, T)
   I = {(F, 0.4), (E, 0.3), (X, 0.1), (Y, 0.1), (I, 0.9), (T, 0.8)}
   $\overline{F}$ = {(F, 0.99), (E, 0.8), (X, 0.1), (Y, 0.2), (I, 0.5), (T, 0.5)}
   Find the following:
      i) $\overline{I} \cup \overline{F}$ ii) $\overline{I} - \overline{F}$
      iii) $\overline{F} - \overline{F}^C$ iv) Verify De Morgan's law
   b) What are the steps involved in fuzzy decision making? Explain different types of fuzzy decision making.

7. a) Explain how GA can be used for solving job shop scheduling problem.
   b) Explain the concept of Swarm intelligence. State where it can be used.

8. Write short note on the following : (any four)
   a) Fuzzy control systems
   b) Significance of Genetic operators
   c) EBPA
   d) Bidirectional associative memory
   e) A* algorithm

****** 238