1079

B.E. (Computer Science and Engineering)
Eighth Semester
CSE-816: Soft Computing

Time allowed: 3 Hours   Max. Marks: 50

NOTE: *Attempt _five_ questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I.   Attempt the following:-

    a) Compare classical logic and fuzzy logic.

    b) What are Hopfield networks.

    c) State the difference between agent function and agent program?

    d) What role is played by activation function in artificial neural network?

    e) What is the basic principle behind simulated Annealing?   (5x2)

UNIT – I

II.   a) Define agents. Explain the basic kinds of agent program and their utilities?

    b) What does it mean for a planning graph to level off? Under what circumstances does this happen and why?   (2x5)

III.   a) Compare and Contrast Classical logic and fuzzy logic. Define various membership functions. Suppose 1000 people respond to a questionnaire about their pain/vise preference among five cars. Define fuzzy sets on the universe of cars for "best car", "average car" and "below average cars". Draw appropriate membership functions.

    b) What is the importance of Bayesian theorem in soft computing? Define Bayesian network? List down the various applications of Bayesian network.   (2x5)

IV.   a) What is Kalman filter and explain briefly its working.

    b) Explain the working of hidden Markov models?   (6,4)

UNIT – II

V.   a) Construct a feed-forward network with five input nodes, three hidden nodes and four output nodes that 5 has lateral inhibition structure in the output layer. Work out dimensions of the weight matrix for all layers.

    b) Define Back-propagation in Neural Network and explain the testing algorithm for Back-propagation Network.   (2x5)

P.T.O.

VI.   a) Write a short note on Adaptive networks based fuzzy inference system.

   b) What is meant by Unsupervised Learning? Discuss the important features of Kohenon's Self-Organizing Maps.

   (4,6)

VII. a) What do you understand by evolutionary algorithms? Mention the various operators and applications of genetic algorithms.

   b) Consider a Kohonen net with two cluster units and five input units. The weights vectors for the cluster units are W1 = (1.0, 0.9, 0.7, 0.3, 0.2) W2 = (0.6, 0.7, 0.5, 0.4, 1.0). Use the square of the Euclidean distance to find the winning cluster unit for the input pattern x = (0.0, 0.2, 0.1, 0.2, 0.0). Using a learning rate of 0.2, find the new weights for the winning unit.

   (2x5)

x-x-x