9. What is difference between robot and robotics ? What can robots do ? Explain various components of robot. How are Soft Computing techniques used and useful in robots ? Explain in detail.

67207

MCA 5th Semester CBCS Scheme

(w. e. f. 2018-19)

Examination – December, 2018

SOFT COMPUTING

Paper : 18MCA35C2

Time : Three Hours]   *[Maximum Marks : 80*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. **1** is *compulsory*. All questions carry equal marks.

1. (a) What is role of dendrites in biological neuron ?

   (b) What is axon in biological neuron ?

   (c) What is the significance of weights in artificial neural network ?

   (d) Define activation function.

   (e) Draw fuzzy membership function to describe cold, warm and hot water using your own intuition.

(f) What is linguistic variable ? Write any *two* linguistic variables.

(g) What is fuzzy proposition ? 'Write any *two* fuzzy propositions.

(h) Write any *two* uses of soft computing techniques in drug design ?

UNIT – I

2. (a) What is neural network ? What are the types of problems that can be solved with neural networks ? Discuss its advantages and disadvantages.

(b) What is soft computing ? Differentiate between soft computing and hard computing.

3. (a) Describe the basic principle of genetic algorithm. What are the applications of genetic algorithm ?

(b) What do you mean by encoding in GA ? Explain different techniques of encoding in GA.

UNIT – II

4. (a) What is perceptron net ? Explain the architecture and learning algorithm of perceptron for pattern recognition problem.

(b) Develop a perceptron for logic AND function with bipolar input and targets.

5. (a) What is back propagation network ? Derive the expression for weight updation in a multilayer feed forward neural network using standard back propagation learning.

(b) Explain in detail about discrete Hopfield network. What kind of applications can be solved using Hopfield network ?

UNIT – III

6. (a) What is fuzzy set ? Explain the characteristics of fuzzy sets.

(b) What do you mean by membership function ? Explain its types and properties.

7. (a) Define Fuzzy Logic Controller (FLC) and discuss various steps involved in designing an Fuzzy Logic Controller.

(b) Explain fuzzy rule base for the air conditioner control.

UNIT – IV

8. What is image processing ? Explain the fundamental steps in image processing with the help of block diagram. How are Soft Computing techniques used and useful in image processing ? Explain in detail.