Roll No. | | | | | | | |

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TCS–723

B. Tech. (CS) (Seventh Semester)
End Semester EXAMINATION, 2017
SOFT COMPUTING

Time : Three Hours] [*Maximum Marks : 100*

Note : (i) This question paper contains *five* questions.

(ii) All questions are compulsory.

(iii) Instructions on how to attempt a question are mentioned against it.

(iv) Total marks assigned to each question are **twenty.**

1. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

   (a) Differentiate between biological neuron and artificial neuron on the basis of structure and function of a single neuron.

   (b) Why bipolar data is more suitable in Hebb network ? Design a Hebb net to implement logical AND function (use bipolar inputs and targets).

(c) Write short notes on the following :

(i) Delta Learning rule

(ii) Activation functions

2. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) What is building block of the Perceptron ? Does perceptron require supervised learning ? If no what does it requires ? List the limitations of perceptron.

(b) Write short notes on the following :

(i) Hopfield network

(ii) Recurrent network

(c) Explain the back propagation network. Discuss its limitations and applications.

3. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) What is fuzzy logic ? Explain its importance. Also write down its applications.

(b) (i) Given the two fuzzy sets 8

$$B1 = \left\{ \frac{1}{1.0} + \frac{0.75}{1.5} + \frac{0.3}{2.0} + \frac{0.15}{2.5} + \frac{0}{3.0} \right\}$$

$$B2 = \left\{ \frac{1}{1.0} + \frac{0.6}{1.5} + \frac{0.2}{2.0} + \frac{0.1}{2.5} + \frac{0}{3.0} \right\}$$

Find the following :

(1) $B1 \cup B2$

(2) $B1 \cap B2$

(3) $B1 | B2$

(4) $\overline{B1 \cup B2}$

(ii) Find the power set and cardinality of the given set X = {2, 4, 6}. Also find the cardinality of power set. 2

(c) Discuss in detail the operations of fuzzy set using Venn diagram. Also explain the properties of fuzzy set.

4. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) What is fuzzy inference system ? Discuss the various methods of fuzzy inference system.

(b) Define membership function and state its importance in fuzzy logic. Explain the features of membership functions.

(c) What is Fuzzification and Defuzzification ? State the necessity of defuzzification process.

5. Attempt any *two* questions of choice from (a), (b) and (c). (2×10=20 Marks)

(a) What is meant by genetic algorithm ? Compare and contrast traditional algorithm and genetic algorithm. Explain the basic terminologies of genetic algorithm in brief.

(b) With a neat flow chart, discuss the general genetic algorithm.

(c) Write short notes on the following :

(i) Types of Crossover

(ii) Mutation