Reg. No. :

Question Paper Code : X86726

M.E./M.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021
Second Semester
Control and Instrumentation Engineering
IN 5091 – SOFT COMPUTING TECHNIQUES
(Common to M.E. Instrumentation Engineering/M.E. Power Systems Engineering)
(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Compare hard computing vs soft computing.
2. Draw the basic model of a Madaline network.
3. What is counter propagation network ?
4. State the adaptive resonance theory.
5. Compare crisp and fuzzy sets.
6. What is the principle of centre of gravity method of defuzzification ?
7. List the learning methods used for propagation network.
8. Mention the role of fitness function in GA and what are the requirements of GA.
9. Name any two search techniques used for solving optimization problems.
10. Define stability.

PART – B **(5×13=65 Marks)**

11. a) Explain the working of back propagation neural network with neat architecture and flowchart. **(13)**

(OR)

b) Discuss the features of a simple Kohonen self organizing network with 2 inputs and 49 outputs show how this is deployed as a competition based network paradigm for data clustering and how the network is trained. **(13)**

12. a) Explain the algorithmic steps involved to solve any one of the optimization problem using Hopfield neural network. State the problem clearly and explain the mapping of the same to the Hopfield network. **(13)**

(OR)

b) Explain characteristics features, limitations and applications of associative memory. **(13)**

13. a) Explain different types of Defuzzification with suitable example. **(13)**

(OR)

b) Explain the working of self organizing FLC. Mention its advantage over fuzzy logic controller. **(13)**

14. a) Explain the concepts of genetic algorithm and steps involved in its algorithm. **(13)**

(OR)

b) Discuss algorithmic steps involved in solving an optimization problem using Tabu search with suitable examples. **(13)**

15. a) Describe the steps involved in unit commitment problem solving using GA application. **(13)**

(OR)

b) Elaborate on stability analysis of NN interconnection systems. **(13)**

PART – C **(1×15=15 Marks)**

16. a) Describe briefly the modeling and implementation of FLC for inverted pendulum. **(15)**

(OR)

b) Illustrate the implementation of a fuzzy logic controller using MATLAB fuzzy logic tool box with a suitable examples. **(15)**

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