Code No: **R4202A** **R10** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015

AI TECHNIQUES

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1 a) In what way the humans are better than computer? Explain. [7]

b) How do you classify the methods of AI techniques? Explain any one method with neat schematic. [8]

2 a) What are the main differences among the three models of artificial neuron, namely, McCulloch-Pitts, Perceptron and adaline? [8]

b) Write the chronological order of historical development of neural network. [7]

3 a) Define feedforward recall. Draw the block diagram of error back propagation algorithm and explain. [10]

b) What are the limitations of back propagation algorithm? [5]

4 a) Define the objective function. Discuss the creation of offspring. [8]

b) Illustrate the working principle of GA. Explain i) Permutation encoding ii) tree encoding. [7]

5 a) Explain the following:
i) Inversion ii) deletion and regeneration iii) segregation [6]

b) What is mutation rate? Discuss the shift left and shift right operators. Draw the genetic algorithm cycle. [9]

6 a) Show that De Morgan's Laws are duals. [7]

b) Two fuzzy sets defined by A={(x_1,0.2) (x_2,0.5)(x_3,0.6)} and B={(x_1,0.1) (x_2,0.4)(x_3,0.5)} find i) product of a fuzzy sets ii) intersection iii) complement [8]

7 a) State the major implicit assumptions in a fuzzy control system design. [8]

b) Explain the Inference mechanism. [7]

8 How can an Artificial Neural Network be applied for reactive power control? Explain in detail. [15]

Code No: **R4202A** **R10** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015

AI TECHNIQUES

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
****

1 a) What do you mean by knowledge representation? Where it is used in neural networks. [8]
b) How do you differentiate between learning process and learning tasks? [7]

2 a) Prove that the two classes of patterns are trainable in a finite number of training steps. [7]
b) What do you mean by perceptron? Define and classify the pattern. How do you classify two classes of patterns in two dimension space with neat schematic? [8]

3 a) Compare RBF and multilayer perceptron networks. [8]
b) Write approximation properties of radial basis function network. [7]

4 a) Define GA search space? Explain the most important aspects of using genetic algorithm. [9]
b) Write the chronological order of historical development of genetic algorithm. [6]

5 a) How do you represent the even and odd number of cross sites in multi point cross over with neat schematic? [7]
b) What is meant by cross over rate? Explain its importance in GA. [8]

6 a) Discuss about the operations on relations. [7]
b) Two fuzzy sets defined by A={(x_1,0.2) (x_2,0.5)(x_3,0.6)} and B={(x_1,0.1) (x_2,0.4)(x_3,0.5)} find (i) power of a fuzzy sets (ii) difference (iii) disjunctive sum [8]

7 Design and develop a temperature control system of a room by FLC model. Formulate necessary membership functions and required fuzzy rules for the application. [15]

8 Illustrate the concept of load frequency control and how fuzzy logic control is helping in the load frequency control problems. [15]

Code No: **R4202A** **R10** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015

AI TECHNIQUES

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1 a) What is meant by learning process? How do you train the artificial neural network? [8]

b) Justify the statement "Biological neural networks exhibit fault tolerance". [7]

2 a) What do you mean by topology of artificial neural networks? Give a few basic topological structures of artificial neural networks. [9]

b) Write the limitations of perceptron model with examples. [6]

3 Give the architecture and algorithm of Back propagation network and derive the weight change formula in each layer. [15]

4 a) Explain the binary encoding with knapsack problem. [5]

b) What do you mean by fitness function? Explain with help of two bar pendulum. [10]

5 a) Differentiate between reproduction operator and cross over operator. [5]

b) What is the importance of cross over mask in uniform cross over? Explain the matrix cross over with neat sketch. [10]

6 a) Explain the following with example [7]
i) universe of discourse ii) set iii) venn diagram

b) With simple diagram, illustrate fuzzy and crisp situations. [8]

7 a) Explain the following
i) centroid method ii) centre ofsums iii) Knowledge base iv) Fuzzification [8]

b) Explain about the defuzzification to crisp sets. [7]

8 How can an Artificial Neural Network be applied for speed control of ac motor? Explain in detail. [15]

Code No: **R4202A** **R10** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, April - 2015

AI TECHNIQUES

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks

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1 a) Justify the statement "information in the brain is adaptable where as in computer is strictly replaceable". [8]

b) Discuss with neat schematic diagram of supervised and unsupervised learning. [7]

2 a) What are the main differences among the three models of perceptron, namely, discrete, continuous and multicategory? [10]

b) Write the applications of perceptron models. [5]

3 "The optimum number of hidden layers in back propagation is two". Justify. What happens if number of hidden layers increases? Explain. [15]

4 Define the selection operator. Write the methods of selecting chromosomes for parents to crossover. Discuss any three methods. [15]

5 a) What do you mean by cross over? What are the three steps to recombine the two strings? [8]

b) Explain i) Two point cross over ii) Uniform crossover [7]

6 a) Define with example i) membership ii) cardinality iii) super set [6]

b) A is set defined by A={3,4,6,7}find i) cardinality ii) super set iii) membership function for x=4 and y=8 write comment on that? [3]

c) What do you understand by membership functions? Draw the different membership functions? [6]

7 a) Explain the following fuzzy logic controller components.
i) Fuzzy inference engine ii) Rule base iii) Data base iv) Fuzzification [7]

b) Explain the following membership value assignment
i) Intuition ii) Inference iii) Rank ordering iv) Inductive reasoning [8]

8 Illustrate the concept of economic load dispatch and how genetic algorithm is helping in the economic load dispatch problems. [15]