Code No: G4308/R13

M. Tech. I Semester Supplementary Examinations, January-2017
ARTIFICIAL INTELLIGENCE TECHNIQUES
(Common to PE, P&ID, PE&ED, PE&D, EM&D and PE&PS)

Time: 3 hours   **Max. Marks: 60**

Answer any FIVE Questions
All Questions Carry Equal Marks

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1. a What is simple perceptron? Explain the adaptive linear element with neat schematic. [7]
   b Discuss the concept of artificial neural network and its basic mathematical model. [5]

2. a How do you train the neural network? Explain the different types of learning. [8]
   b Explain how back propagation network is used as differentiator. [4]

3. a Explain the architecture and training of Kohonen's self-organizing network. [6]
   b What happens if number of hidden layers increases in back propagation? Explain. [6]

4. a What do you mean by fitness function? Explain the adjustment of free parameters. [6]
   b Explain the particle swarm optimization. [6]

5. a Distinguish between the crisp sets and fuzzy sets with examples. [6]
   b What is the significance of membership function? Explain the fuzzy rule base system. [6]

6. a What is inference system? Explain the construction of fuzzy logic control. [6]
   b The two fuzzy sets $\tilde{A}$ and $\tilde{B}$ defined by [6]

   $$\tilde{A} = \{(x_1, 0.2)(x_2, 0.5)(x_3, 0)\}, \qquad \tilde{B} = \{(x_1, 0.6)(x_2, 0.1)(x_3, 0.3)\}$$

   find
     i. $\tilde{A} \cap \tilde{B}$
     ii. $\tilde{A}^c \cup B$
     iii. $\tilde{A} \cup \tilde{B}$.

7. a Describe the flux programming efficiency improvement of three phase induction motor using fuzzy logic controller. [8]
   b How do you estimate the speed of an Induction motor? [4]

8. a What do you mean by flux estimation? How do you estimate the flux of an Induction motor using Neural networks? [7]
   b Explain the feedback signal estimation by using Neural Networks. [5]

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