Subject Code: G4308/R13

M. Tech –I Semester Regular/ Supply Examinations, February, 2016

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) Discuss the key developments and its other significant contributions of artificial neural networks?
   b) Write the characteristics of ANN? Explain the McCulloch-Pitts Model with neat sketch?

2. a) What is the Hopfield network? What are the limitations of Hope-field network?
   b) What are the steps involved in the back propagation algorithm. Explain

3. Explain the concept of genetic algorithm? Write in detail the algorithmic steps?

4. a) Describe the basic fuzzy set operations and their relations?
   b) The fuzzy sets $\tilde{A}, \tilde{B}, \tilde{C},$ are all defined on the universe X = {0, 5}with the following membership functions

   $\mu_{\tilde{A}}(x) = \frac{1}{1+5(x-5)^2}$; $\mu_{\tilde{B}}(x) = 2^{-x}$; $\mu_{\tilde{C}}(x) = \frac{2x}{x+5}$ Sketch the membership functions.

5. Discuss in detail about the speed estimation of induction motor by using neural networks?

6. Explain with neat schematic for the following
   a) Supervised learning
   b) Unsupervised learning
   c) Reinforcement learning

7. a) Why convergence is not guaranteed for the back propagation learning algorithm?
   b) Discuss the procedure to solve a typical control problem using PSO?

8. a) Explain the implementation of fuzzy logic controller using Matlab fuzzy-logic toolbox?
   b) Explain about the selected harmonics elimination PWM by using neural networks?

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