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**Question Paper Code : 11687**

M.E. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Elective

Power Systems Engineering

PE 9275/CO 951/PS 9002/10233 PSE 12 — SOFTWARE COMPUTING  
TECHNIQUES

(Common to M.E. Control and Instrumentation Engineering/M.E. Electrical Drives  
and Embedded Control/M.E. Power Electronics and Drives/M.E. Embedded System  
Technologies/M.E. Power Management)

(Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is Quantifiers?
2. State some advantages of artificial intelligence system.
3. What is sigmoid function? Write the logistic sigmoid function.
4. Mention any four types of learning rules.
5. Mention the various properties of fuzzy sets.
6. What are the basic elements of a fuzzy logic control system?
7. What is cross over? What are the types of cross over?
8. What is mutation operator? What is called mutation rate?
9. What is meant by Identification?
10. Mention the various Simulink tools available for Fuzzy logic control.

PART B — (5 × 16 = 80 marks)

11. (a) With a neat block diagram briefly explain various components of an Expert System and the role of each one of these.

Or

- (b) With a neat block diagram briefly explain the various components of a Intelligent control system.
12. (a) Explain the architecture and algorithm of MADALINE network with an example.

Or

- (b) Explain the architecture and algorithm of Kohonen self organising network with an example.
13. (a) Discuss and compare the methods of defuzzification used in fuzzy logic with examples.

Or

- (b) With a neat sketch explain Fuzzy logic control for a nonlinear time-delay system.
14. (a) Briefly explain Genetic algorithm in terms of Reproduction, Selection, Evaluation and Replacement.

Or

- (b) Briefly explain any two search techniques for optimization.
15. (a) Explain the design of a nonlinear control system using neural network. Also explain the implementation steps in MATLAB.

Or

- (b) Briefly explain the application of genetic algorithm to power system optimization problem.