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Question Paper Code : 51485

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Seventh Semester

Electrical and Electronics Engineering

EE 2025/EE 702 – INTELLIGENT CONTROL

(Regulations 2008)

**(Common to PTEE 2025 – Intelligent control for B.E. (Part-Time) Sixth Semester EEE –
Regulations 2009)**

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What are the different intelligent control approaches ?
2. What is meant by symbolic reasoning ?
3. Draw a neat sketch of McCulloch-Pitts neuron architecture.
4. State the delta learning rule.
5. How are the free parameters of GA adjusted ?
6. Write short notes on mutation.
7. Define crisp set and fuzzy set.
8. List the various types of defuzzification techniques.
9. List the elements present in MATLAB fuzzy logic tool box.
10. Mention any MATLAB commands used for analysing stability of control system.

PART – B (5 × 16 = 80 Marks)

11. (a) With a suitable case study, explain expert system in detail.

OR

- (b) With a suitable functional block diagram, explain the working of intelligent control.

12. (a) (i) Discuss in detail the training algorithm used in back propagation net. (8)
(ii) How in “Winner-takes-all” process executed by competitive learning? (8)

OR

- (b) Give the architecture and training algorithm of a Kohonen self organizing Network and explain them. (16)

13. (a) Explain the mechanism of Genetic algorithm based optimization technique for a typical control problem. (16)

OR

- (b) Explain the concept of Tabu search technique in detail. (16)

14. (a) Let the membership functions of two fuzzy numbers A and B defined as :

$$\mu_A(x) = \begin{cases} 0, & x \leq 7 \\ x-7, & 7 \leq x \leq 8 \\ -x+9, & 8 \leq x \leq 9 \\ 0, & x \geq 9 \end{cases} \quad \mu_B(x) = \begin{cases} 0, & x \leq 3 \\ x-3, & 3 \leq x \leq 4 \\ -x+5, & 4 \leq x \leq 5 \\ 0, & x \geq 5 \end{cases}$$

Find the multiplication and division of two fuzzy numbers using α -cut method. (16)

OR

- (b) Explain fuzzification, inferencing and defuzzification techniques of fuzzy-systems. (16)

15. (a) (i) Write a MATLAB program to train a neural network for identification application. (8)
(ii) How the stability of neural network can be analyzed? (8)

OR

- (b) (i) How a fuzzy logic controller is implemented using MATLAB fuzzy logic tool box? (8)
(ii) Discuss the stability analysis of fuzzy control. (8)