

**Registration No.**

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**M.E./M.Tech. Degree Examinations, January 2017**

**First Semester**

**APPLIED ELECTRONICS**

**CP16036 – SOFT COMPUTING**

**(Regulation 2016)**

**QP Code: 548792**

**Time: Three hours**

**Maximum : 100 marks**

Answer **ALL** questions

**PART A - (10 X 2 = 20 Marks)**

1. Define supervised and unsupervised learning algorithm. Give an example to each.
2. What do you mean by classification problem and regression problem?
3. Define crossover probability & mutation probability.
4. How does genetic algorithm differ from conventional optimization techniques?
5. What is the role of learning rate and momentum term in ANN?
6. Draw single-output RBFN that uses weighted sum and weighted average.
7. Draw the block diagram for a fuzzy inference system.
8. Define core, crossover points & supports in fuzzy set.
9. Draw the concept of neuro-fuzzy spectrum on interpretability-precision plane.
10. What is fuzzy C-means clustering? Give its major difference between Hard C-means clustering.

**PART B - (5 X 16 = 80 Marks)**

11. (a) (i) Discuss in brief on architecture of an artificial neural network used in machine learning. **(8)**
- (ii) What are constituents of soft computing? Give the comparative characteristics of components of soft computing. **(8)**

**(OR)**

- (b) (i) Define the following terminologies with regard to machine learning: **(8)**  
Curse of dimensionality, Overfitting, Generalization, Cross validation.
- (ii) Explain the concept of Support Vector Machine with suitable **(8)**

diagrams.

12. (a) State the Job shop scheduling problem and explain the methodology used to arrive optimized solution for the problem by applying GA in detail. (16)

(OR)

- (b) Discuss the following processes involved in genetic algorithm in brief. (16)  
Encoding, Reproduction, Cross over & Mutation, Stopping criteria.

13. (a) Discuss the architecture of ART1 network with neat diagrams in detail. (16)

(OR)

- (b) Explain in detail the back propagation training algorithm for the updation of weights in feedforward neural network. (16)

14. (a) What are linguistic variables and values used in fuzzy rules? Explain compositional rule of inference and approximate fuzzy reasoning for single/multiple rule and its antecedents with neat diagrams. (4+12)

(OR)

- (b) Write short notes on the Mamdani and Tsukamoto fuzzy models in fuzzy inference system. (10+6)

15. (a) Discuss in detail about ANFIS architecture and the hybrid learning algorithm with neat diagram. (16)

(OR)

- (b) Discuss the fundamentals of inverse learning and the concept of specialized learning in Neuro-fuzzy control. (16)