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EE-7102**B.E. VII Semester**

Examination, December 2016

Soft Computing Techniques and Applications**Time : Three Hours****Maximum Marks : 70**

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each question are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

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1. a) Define continuous and discrete distributions.
 b) What are the function of random variable?
 c) Given the following PDF for the random variable T, the time (in operating hours) to failure of a compressor, what is its reliability for a 100 hours operating life?

$$f(t) = \begin{cases} \frac{0.001}{(0.001t+1)^2} & , \quad t \geq 0 \\ 0 & , \text{otherwise} \end{cases}$$

- d) Explain the significance of confidence interval, confidence level and coefficient of variation in statistical analysis of data.

OR

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What is Monte-Carlo simulation technique? How does the Monte-Carlo simulation work? State the benefits of Monte-Carlo simulation technique.

2. a) Compare soft computing Vs hard computing.
- b) List the various types of soft computing techniques and mention application areas.
- c) What are the different activation functions used and different learning rules available?
- d) Write the algorithm for back propagation for back propagation training and explain about the updation of weight.

OR
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With a neat sketch explain the operation (Training and Testing) of a radial basis function neural network.

3. a) What is the main function of cross over operation in Genetic algorithm?
- b) What are the limitations of GA?
- c) What are the strategies in GA and the parameters of GA?
- d) Summarize the sequential procedures involved in the cross over and reproduction phase of GA with typical examples.

OR

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Let a function $f(x) = x - \frac{x^2}{16}$ be defined on the interval $[0, 31]$. Illustrate the use of GA for determining the maximum of the given function (Assume suitable missing data).

4. a) What is Evolution strategy?
- b) Distinguish between evolution strategies and genetic algorithms. www.rgpvonline.com
- c) Describe the general outline of an evolutionary algorithm.
- d) Assume a typical control problem and explain the various steps involved in finding a solution of problem using particle swarm optimization technique.

OR

Describe two members non-recombinative and multi-member recombinative evolution strategies.

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5. a) Define Linear system and a nonlinear system.
- b) What are the advantages of evolutionary algorithms over conventional optimization techniques.
- c) What is a Hybrid intelligent control? Explain.
- d) Suggest a suitable evolutionary computing technique for finding optimized economic load dispatch and write its algorithm.

OR

Explain how will you optimize the electrical load regulation problem using ANN and evolutionary algorithm.

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