

B.E. (Computer Technology) Seventh Semester (C.B.S.)  
**Elective - I : Computational Intelligence**

P. Pages : 2

Time : Three Hours



**TKN/KS/16/7566**

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions No. 2.
  3. Solve Question 3 OR Questions No. 4.
  4. Solve Question 5 OR Questions No. 6.
  5. Solve Question 7 OR Questions No. 8.
  6. Solve Question 9 OR Questions No. 10.
  7. Solve Question 11 OR Questions No. 12.
  8. Due credit will be given to neatness and adequate dimensions.
  9. Assume suitable data whenever necessary.

1. a) Explain block diagram of computational intelligence paradigm. 7  
b) What are the classes of evolutionary algorithm. 7

**OR**

2. a) What is PSO? What are its applications. 7  
b) Explain models of natural immune system. 7
3. a) Explain fuzzyfication and de.fuzzyfication. 7  
b) Write short note on fuzzy sets. 6

**OR**

4. Explain fuzzy knowledge base air conditioner controller. 13
5. a) Explain the architecture of neural network. 13

**OR**

6. a) Compare the supervised and unsupervised learning algorithm. 6  
b) Consider following set of input training vectors and initial weight vector. 7

$$x_1 = \begin{bmatrix} 1 \\ -2 \\ 0 \\ 1 \end{bmatrix} \quad x_2 = \begin{bmatrix} 0 \\ 1.5 \\ -0.5 \\ -1 \end{bmatrix} \quad x_3 = \begin{bmatrix} -1 \\ 1 \\ 0.5 \\ -1 \end{bmatrix} \quad w^1 = \begin{bmatrix} 1 \\ -1 \\ 0 \\ 0.5 \end{bmatrix}$$

learning constant is assumed to be  $\leq 0.1$ . Derive responses for  $x_1, x_2, x_3$  are  $d_1 = -1, d_2 = -1, d_3 = 1$  perform one training cycle using perception learning.

7. a) What is the fitness function in genetic algorithm. 7  
b) Which are the basic operators used by a simple genetic algorithm. Explain one of them. 6

**OR**

8. a) Give the differences and similarities between genetic algorithm and other traditional methods. 7  
b) Write short note on chromosomes. 6
9. a) Which are velocity components of gbest PSO? 7  
b) Discuss similarities and differences between PSO and EAs. 6

**OR**

10. a) Discuss how PSO can be used to cluster dealing Ant colony system. 7  
b) What are basic PSO parameters. 6
11. a) Which optimization problem have influence over fitness function. 7  
b) Explain steps in EA. 7

**OR**

12. a) What are convergence criteria used for stopping condition. 7  
b) Differentiate between Genetic and phenotypic evolution. 7

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