

**CS-8001 (CBGS)**  
**B.E. VIII Semester Examination, June 2020**  
**Choice Based Grading System (CBGS)**  
**Soft Computing**  
**Time : Three Hours**

**Maximum Marks : 70**

- Note:** i) Attempt any five questions.  
ii) All questions carry equal marks.

1. a) Define soft computing. Differentiate it with hard computing? Write down the application areas of soft computing.  
b) Explain the structure and functioning of biological neuron?
2. a) What is linear separable and linear non separable problem? Explain it with suitable example.  
b) Explain different pattern recognition tasks performed by basic functional units of ANN.
3. a) What are the different factors that affect the performance of back propagation learning algorithm? Explain.  
b) What is Hopfield network? Explain algorithm to store and recall a set of Dipolar patterns in Hopfield network.
4. a) With architecture explain the training algorithm used in Kohonen self organizing feature map.  
b) What is learning in neural networks? Differentiate between supervised and unsupervised learning.
5. a) Explain any four defuzzification methods with suitable example.  
b) Explain Mamdani's and Zadeh's interpretation of Fuzzy rule.
6. a) Discuss different operations performed on fuzzy sets with example of each.  
b) Explain the different crossover operators used in Genetic Algorithm?
7. a) Explain the working principle of Genetic Algorithm.  
b) Explain Rough set theory? How is it different with Fuzzy set theory.
8. Write short notes:
  - i) Swarm intelligence
  - ii) Ant colony optimization
  - iii) Bee colony optimization
  - iv) Linear and Nonlinear SVM classifiers.

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