

B.Tech. VIII Sem. (Main/Back) Examination, June - 2022

Open Elective - II

8EE6-60.2 : Open Elective-II Soft Computing

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

**Instructions to Candidates:**

Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Four questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

**PART - A**

(Answer should be given up to 25 words only)

All questions are compulsory

(10×2=20)

1. Define the aims of Soft Computing.
2. Give Applications of Fuzzy Sets.
3. Define Union Fuzzy Operation.
4. Define Artificial Neural Network.
5. Define Search Space and Optimization.
6. Define Fuzzy logic.
7. Define Genetic Operator-Crossover and Mutation.
8. Define Fuzzy Neural Networks.
9. Define Genetic Algorithms.
10. Define Neuro-Fuzzy Identification.

**PART - B**

(Analytical/Problem solving questions)

Attempt any Five questions

(5×8=40)

1. Describe Fuzzy Operations discussing following with examples.
  - i) Inclusion
  - ii) Equality
  - iii) Complement
  - iv) Intersection

2. Discuss and compare Supervised, Unsupervised and Reinforcement Learning in connection with Artificial Neural Network (ANN).
3. Discuss Radial Basis Neural Network along with its advantages.
4. Discuss Adaptive Resonance Theory (ART) along with its advantages.
5. Explain and contrast Conventional and Genetic Search Algorithms.
6. Describe Genetic Algorithm based Optimization. Also explain Genetic Algorithm with mutation.
7. Discuss learning and architecture of Neuro-Fuzzy Systems.

### PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any four questions

(4×15=60)

1. Explain Fuzzy Sets along with its properties. Also discuss Fuzzy Relations.
2. Explain the following architectures of Artificial Neural Networks (ANN) along with their advantages and disadvantages.  
i) Single Layer Feed Forward Neural Networks.  
ii) Multi-Layer Feed Forward Neural Networks.  
iii) Recurrent Neural Networks.
3. Explain Particle Swarm Optimization (PSO) and its application in engineering.
4. Write short note on :  
i) Fuzzification in Neuro-Fuzzy Systems.  
ii) Defuzzification Neuro-Fuzzy Systems.
5. Write short note on any two :  
i) Neural Network Toolbox in MATLAB.  
ii) Fuzzy Logic Toolbox in MATLAB.  
iii) Genetic Algorithm and Directed Search Toolbox in MATLAB.

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