

Dec.-22-0274

EC-609 (Principles of Soft Computing)

B.Tech. 6th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question from each section A, B, C and D. Question no. 9 is compulsory.

SECTION - A

1. (a) What do you understand by Neural Networks? What are the advantages, application and scope of Neural Network?
(b) With a neat flowchart, explain the training process of perceptron network. (10)
2. (a) State the role of vigilance parameter in ART network.
(b) How does a momentum factor make faster convergence of network? (10)

SECTION - B

3. Consider two given fuzzy sets

$$A = \left\{ \frac{1}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0.2}{8} \right\}$$

$$B = \left\{ \frac{0.5}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{1}{8} \right\}$$

Perform union, intersection, difference and complement over fully sets A and B. (10)

4. (a) Represent the fuzzy sets operations using Venn diagram.

- (b) Describe the importance of fuzzy sets and its application in engineering sector. (10)

SECTION - C

5. Design 1-to-8 DEMUX using Two 1-to-4 Demultiplexers. Write down the applications of Demultiplexer. (10)
6. Design a combinational logic circuit with three inputs, the output is at logic 1 when more than one inputs are at logic 1. (10)

SECTION - D

7. (a) Define classical relations and fuzzy relations.
(b) Write short note on fuzzy equivalence relation. (10)
8. Explain with suitable diagrams and examples fuzzy equivalence relation. (10)

SECTION - E

9. Answer the following:
- (a) Define linear separability.
 - (b) What is the impact of weight in an artificial neural network?
 - (c) What are feature detectors?
 - (d) What is the importance of functional link network?
 - (e) State few applications of Adaline and Madaline.
 - (f) State the Cartesian product of a relation.
 - (g) State the importance of fuzzy sets.
 - (h) What is meant by characteristic function?
 - (i) What is the difference between Multiplexer and Demultiplexer?
 - (j) Draw the diagram of Comparator with single output.

(10×2=20)