(2½ Hours)

[Total Marks: 75]

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labelled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

Q1. Attempt the three of the following. 15 Marks

a. What is Soft Computing? Write applications of soft computing.
b. Explain McCulloch Pitts neuron model with example.
c. Explain the concept of genetic algorithm. Write benefits and applications of genetic algorithm.
d. Write about Adaptive Resonance Theory. Explain the types of ART.
e. Why clustering is considered as a useful method in unsupervised learning. Write applications of clustering?

Q2. Attempt the three of the following. 15 Marks

a. Draw and explain biological neural network. Explain working of neurons.
b. Draw and explain five basic types of neuron connection architectures.
c. Explain Adaptive Linear Neuron (ADALINE).
d. Explain Backpropagation learning algorithm.
e. Explain Time delay and Wavelet neural network.

Q3. Attempt three of the following. 15 marks

a. Explain the working of fixed weight network in the Maxnet network.
b. How Learning Vector Quantization helps in classifying patterns.
c. Write about Counter Propagation network.
d. Explain Kohonen Self Organizing map.
e. What is Maxican hat network? Draw and explain its architecture.

Q4. Attempt three of the following. **15 marks**

a. Discuss about simulated annealing network?

b. Explain the working of multilayer feed forward network Neocognitron.

c. What is Fuzzy Logic? Describe any one application of fuzzy Logic.

d. Explain Fuzzy Equivalence relation with neat diagram.

e. Explain membership functions of fuzzy set.

Q5. Attempt three of the following. **15 marks**

a. What is Genetic Algorithm? Explain with flow chart.

b. Write about alpha cut and Lambda cut in fuzzy relations.

c. Explain methods of defuzzification.

d. Explain Fuzzy inference system in detail.

e. What is schema? Explain Schema theorm in detail.

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