



**B.Tech VIII Semester Regular/Supplementary Examinations, April 2023**

**Artificial Neural Networks**  
(Computer Science and Engineering)

**Maximum Marks: 70**

Date:08.05.2023 Duration: 3 hours

- Note:
- 1.This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

**Part-A**

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Draw the Nonlinear model of the Neuron?
- 2 Mention the neural network Architectures.
- 3 What is steepest descent method in Unconstrained Organization Technique?
- 4 State the LMS algorithm.
- 5 What is Hessian Matrix?
- 6 What is the computational benefit of backpropagation algorithm in sensitivity analysis?
- 7 What are the two Basic Feature Mapping Models?
- 8 Draw the diagram of two-dimensional lattice of neurons?
- 9 What is Hopfield model?
- 10 What is the attractor in a dissipative system?

**Part-B**

Answer All the following questions.

(5X10M=50Marks)

- 11 A. How do you characterize Artificial Intelligent systems?  
B. Discuss learning Process in the context of neural network. 5M  
5M

OR
- 12 A. Explain the structure of biological neuron and simulate the same using artificial neuron. 4M  
B. Briefly explain the Statistical Nature of the Learning Process. 6M
- 13 Write down the perceptron learning algorithm and analyze its convergence. 10M

OR
- 14 Explain how hidden neurons play a crucial role in the operation of multilayer perceptron as feature detectors in back propagation learning? 10M
- 15 A. What are the different heuristics in Accelerated Convergence of Back Propagation Learning? 6M  
B. Compare Quasi-Newton method with Conjugate-Gradient method? 4M

OR
- 16 What is cross validation? Explain how it is used to design a large Neural network. 10M

- 17 Explain the three essential processes involved in the formation of Self-organizing map? 10M  
OR
- 18 A. Propose some adaptive pattern classification with example? 5M  
B. Illustrate the behavior of SOM algorithm using computer simulation? 5M
- 19 A. Discuss Lyapunov's Theorems. 5M  
B. Write about the Manipulation of Attractors as a Recurrent Network Paradigm. 5M  
OR
- 20 Discuss Neuro Dynamical Models in detail? 10M