CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐ 15EC653

Sixth Semester B.E. Degree Examination, July/August 2022
Artificial Neural Networks

Time: 3 hrs. Max. Marks: 80

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. With neat diagram, explain the structure of a Biological Neuron. (06 Marks)
 b. Explain any 5 signal functions used in Artificial Neural Networks. (10 Marks)

OR

2 a. Describe Supervised and Unsupervised Learning. (08 Marks)
 b. Explain Perceptron Learning algorithm with necessary diagrams. (08 Marks)

Module-2

3 a. Derive the convergence condition for μ - LMS algorithm. (08 Marks)
 b. With example, explain the application of LMS algorithm to Noise Cancellation. (08 Marks)

OR

4 a. Derive the expression for hidden to output layer weight gradient and input to hidden layer weight gradient in backpropagation learning algorithm. (10 Marks)
 b. Give the outline of backpropagation learning algorithm. (06 Marks)

Module-3

5 a. What is Empirical Risk Minimization? Explain. (06 Marks)
 b. Explain the support vector machine design objective for linearly seperable class. (10 Marks)

OR

6 a. Discuss the exact interpolator using RBFN. (08 Marks)
 b. Derive the Euler – Lagrange equation for the Tikhohov functional. (08 Marks)

Module-4

7 a. What are Orthogonal Linear Associative Memories? Explain. (06 Marks)
 b. Give the Architecture of Hopfield Auto – Associative Memory. Also explain Electronic circuit interpretation of additive dynamic structure of Hopfield Network. (10 Marks)

OR

8 a. Explain Simulated Annealing. List the basic steps used in Simulated Annealing. (08 Marks)
 b. Explain Brain State in a Box Neural Network. (08 Marks)

Module-5

9 a. Analyse the Adaptation Law where passive decay of weight is proportional to the signal and reinforcement proportional to external input. (08 Marks)
 b. Explain the Extraction of Principal components using Sanger's Rule. (08 Marks)

OR

10 a. Give the operational summary of SOFM algorithm. (06 Marks)
 b. Provide the various steps followed in Growing Neural Gas. (10 Marks)

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