**18ECD52**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **April,2023** | **Electronics & Communication Engineering** | | |
| **Eighth Semester** | **Artificial Neural Networks** | | |
| **Time:** Three Hours | | **Maximum: 5**0 Marks | |
| *Answer Question No. 1 Compulsorily.* | | | (10X1 = 10 Marks) |
| *Answer* ***ANY ONE*** *question from each Unit.* | | | (4X10=40 Marks) |

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| 1. | a) | What is the function of dendrites? | CO1(BL1) |  |
|  | b) | Define Neural Networks? | CO1(BL1) |  |
|  | c) | Distinguish between Auto associative Memory and Hetero Associative Memory | CO2(BL1) |  |
|  | d) | Name the two types of Bidirectional Associative Memory | CO2(BL1) |  |
|  | e) | State the principle of competition. | CO2(BL1) |  |
|  | f) | Draw the structure of a biological neuron | CO1(BL1) |  |
|  | g) | What is stability-plasticity dilemma? | CO3(BL1) |  |
|  | h) | List any two applications of Back Propagation network | CO3(BL1) |  |
|  | i) | Neuro – Fuzzy systems can lead to more powerful neural network?justify. Applications of Neural Networks in Forecasting, | CO4(BL1) |  |
|  | j) | What are the advantages of Neural Networks? | CO4(BL1) |  |
| **Unit - I** | | | | |
| 2. | a) | “Neuron inhibition depends on activation function” Justify this statement with different types of activation functions | CO1(BL1) | **5M** |
|  | b) | Generate the output of logic AND function by McCulloch-Pitts neuron model. | CO1(BL1) | **5M** |
|  |  | **(OR)** |  |  |
| 3. | a) | Explain the working principles of single input neuron, multiple inputs neuron and neurons with “R” number of inputs. | CO1(BL1) | **5M** |
|  | b) | What kind of operations can be implemented with perceptron? Show that it cannot implement Exclusive OR function. | CO1(BL1) | **5M** |
| **Unit - II** | | | | |
| 4. | a) | Discuss the role of mean square error in delta learning rule? State the different steps in delta learning. | CO2(BL1) | **5M** |
|  | b) | Implement Logic OR operation using Hebb’s law learning rule (Binary input and binary output). | CO2(BL2) | **5M** |
|  |  | **(OR)** |  |  |
| 5. | a) | Consider the following problem. We are required to create Discrete Hopfield network with bipolar representation of input vector as [1 1 1 -1] or [1 1 1 0] (in case of binary representation) is stored in the network. Test the Hopfield network with missing entries in the second component of the stored vector(i.e [1 1 0 1]) | CO2(BL1) | **5M** |
|  | b) | A hetero associative network is given. Find the weight matrix and test the network with the training input vectors. S1 = (1,1,0,0) , S2 = (0,1,0,0), S3 = (0,0,1,1), S4 = (0,0,1,0) t1 = (1,0), t2 = (1,0), t3 = (0,1), t4 = (0,1) | CO2(BL1) | **5M** |

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| **Unit - III** | | | | |
| 6. | a) | Construct Self Organizing Kohonen map to cluster following given vectors X1= (0 0 1 1) X2= (1 0 0 0) X3= (0 1 1 0) X4= (0 0 0 1) Number of clusters to be formed is two. Assume initial learning rate =0.5. | CO3(BL1) | **5M** |
|  | b) | What is LVQ? Explain the steps of LVQ in detail. | CO3(BL1) | **5M** |
|  |  | **(OR)** |  |  |
| 7. | a) | Define bottom-up weights and top-down weights. With neat architecture, explain the training algorithm used in ART network. | CO3(BL1) | **5M** |
|  | b) | Discuss various steps involved in solving function approximation with back propagation networks. | CO3(BL1) | **5M** |
| **Unit - IV** | | | | |
| 8. | a) | Explain the applications of Neural Networks in Healthcare. | CO4(BL2) | **5M** |
|  | b) | How neural networks are helpful for business analytics? Explain in detail. | CO4(BL1) | **5M** |
|  |  | **(OR)** |  |  |
| 9. | a) | How neural network is useful for pattern recognition? Explain in detail. | CO4(BL1) | **5M** |
|  | b) | Explain the applications of Neural Networks in Forecasting, | CO4(BL1) | **5M** |

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