May 27, 2024   02:30 pm - 05:30 pm   1T01036 - T.E.(Electronics and Telecommunication)(SEM-VI)(Choice Base Credit Grading System) (R- 19) (C Scheme) / 89344 - Artificial Neural Network and Fuzzy Logic   QP CODE: 10055469

(3 Hours)   **Total Marks: 80**

N.B. : (1) Questions No.**1** is **compulsory**.
       (2) Solve any **three** questions out of **remaining**
       (3) Draw neat labeled diagram whenever necessary
       (4) Assume suitable data if necessary.

Q1   Answer any four questions

    a.   Compare biological neuron with artificial neuron   **05**

    b.   For binary sigmoidal function prove that $f'(x)=f(x)(1-f(x))$ **05**

    c.   What do you mean by delta rule? Explain with equations. Which neural network used delta learning rule?   **05**

    d.   What are the various components of fuzzy inference system?   **05**

    e.   What is the use of pooling layer in CNN architecture? What are the various types of pooling?   **05**

Q2   a.   Analyze the architecture of multilayer perceptron.   **10**

    b.   Draw a basic CNN architecture. Giving examples, discuss strided convolution with necessary equations.   **10**

Q3   a.   Draw the architecture of Kohonen Self Organizing network. Discuss the training steps of Kohonen network.   **10**

    b.   What do you mean by machine learning? Discuss the working of SVM   **10**

Q4   a.   Construct a discrete Hopfield network to store the patterns [1 1 1 -1]. Test discrete Hopfield network with missing values in first and second components of stored vector.   **10**

    b.   Implement AND gate using MP Neuron.   **10**

Q5   a.   With neat flow chart, discuss the various phases of error back propagation algorithm.   **10**

    b.   What are the various steps involved in image classification using CNN?   **10**

Q6   a.   Define a fuzzy set. What are the properties of fuzzy sets?   **10**

    b.   Design a fuzzy controller to decide the washing time of a washing machine. Dirt and type of cloth fabric are input variables. Consider four descriptors for inputs and output   **10**

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