Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

G:\logo and QP Template\logo 3 Feb 2018 final.tif

**End Semester Examination – Nov/Dec – 2018**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **17EE3031** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NEURO-FUZZY CONTROLLERS FOR ELECTRIC DRIVES** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain the Biological Neurons with artificial neuron model. | CO1 | 10 |
| b. | Elaborate the concept of the Hopfield architecture and its learning algorithm. | CO1 | 10 |
| (OR) | | | | |
| 2. |  | Find the new weights of the back propagation network is illustrated in the figure, where the input pattern is [0.6 0.8 0] and target output is 0.9. Use learning rate α = 0.3 and use binary sigmoid activation function. | CO1 | 20 |
| 3. | a. | Sketch the architecture of ART network and discuss its training algorithm. | CO2 | 15 |
| b. | List the fixed weight competitive nets. | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | With neat architecture, elaborate the training algorithm of Kohonen self-organizing feature maps. | CO3 | 15 |
| b. | Write the principle involved in learning vector quantization. | CO3 | 5 |
|  |  |  |  |  |
| 5. | a. | Discuss in detail the operations and properties of fuzzy sets. | CO3 | 5 |
| b. | For a speed control of DC motor, the membership functions of series resistance, armature current and speed are given as follows:  Compute relation for relating series resistance to motor speed, i.e., . Else calculate max-min composition only. | CO3 | 15 |
| (OR) | | | | |
| 6. | a. | Explain the operations and properties over a fuzzy relation. | CO4 | 10 |
| b. | Consider two fuzzy sets  Find the algebraic sum, algebraix product, dounded sum and bounded difference of the given fuzzy sets. | CO4 | 10 |
|  |  |  |  |  |
| 7. | a. | With a suitable application case study explain a fuzzy logic controller. | CO4 | 10 |
| b. | Mention the features of a simple FLC system. | CO5 | 10 |
| (OR) | | | | |
| 8. |  | Explain in detail the methods employed for converting fuzzy form into crisp form. | CO5 | 20 |
|  | |  |  |  |
|  | | **Compulsory:** |  |  |
| 9. |  | Clarify the concept of fuzzy controllers for switched reluctance motor drives in detail. | CO6 | 20 |