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



**End Semester Examination – Nov / Dec – 2019**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **18EC3011** | **Duration :** | **3hrs** |
| **Sub. Name :** | **COMPUTATIONAL INTELLIGENCE AND OPTIMIZATION TECHNIQUES** | **Max. Marks :** | **100** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
| **ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)** | | | | |
| 1. | a. | Illustrate the training algorithm of back propogation neural network with neat architecture. Use mathematical equations wherever necessary. | CO1 | 12 |
| b. | Distinguish between supervised and unsupervised learning methodologies. | CO1 | 4 |
|  |  |  |  |  |
| 2. |  | “Adaptive Resonance Theory neural networks are used to solve the plasticity-stability problem”. Justify this statement with diagrams and mathematical equations. | CO1 | 16 |
|  |  |  |  |  |
| 3. | a. | Explain the various defuzzification methods with graphical illustrations and mathematical equations. | CO3 | 12 |
| b. | Distinguish between classical sets and fuzzy sets. | CO3 | 4 |
|  |  |  |  |  |
| 4. | a. | Outline the functions of 2-rule, 2-input Adaptive Inference Neuro Fuzzy Inference System with neat architecture. | CO4 | 12 |
| b. | Compare and contrast fuzzy c-means algorithm with k-means algorithm. | CO4 | 4 |
|  |  |  |  |  |
| 5. | a. | Illustrate the procedure of Particle Swarm Optimization with necessary mathematical equations. | CO5 | 8 |
| b. | Explain the optimization procedure of Ant Colony algorithm with necessary mathematical equations. | CO5 | 8 |
|  |  |  |  |  |
| 6. |  | Illustrate the electrical functions and chemical functions of human brain with neat diagrams. Use mathematical equations wherever necessary. | CO1 | 16 |
|  |  |  |  |  |
| 7. | a. | “Kohonen neural networks are widely preferred for clustering applications”. Justify this statement. | CO1 | 8 |
| b. | “Hopfield neural networks are more stable than other neural networks”. Justify this statement. | CO1 | 8 |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. |  | Develop a framework for medical image classification applications using artificial neural networks. | CO6 | 20 |