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



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

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| **Code :** | **18EI3017** | **Duration :** | **3hrs** |
| **Sub. Name :** | **OPTIMIZATION TECHNIQUES FOR EMBEDDED SYSTEMS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Sub Div.** | **Questions** | **Course Outcome** | **Marks** |
| **ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)** | | | | |
| 1. | a. | Discuss about the simple artificial neuron and derive the calculation of net input. | CO1 | 8 |
| b. | Explain in detail the back propagation network training with flowchart. | CO1 | 8 |
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| 2. |  | Perform two training steps for the neural network using the windrow-hoff learning rule. Assume the training data x1= , d1= , x2= , d2=1 and initial weight vector is w1= t with µ=1 and c=0.25. | CO1 | 8 |
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| 3. | a. | Illustrate the implementation of fuzzy logic controller using MATLAB fuzzy logic control toolbox with a suitable example. | CO2 | 8 |
| b. | Discuss steps involed in ANFIS optimization technique with relevant example. | CO3 | 8 |
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| 4. | a. | Solve the following linear programming problem using simplex method. Maximize z= subject to the constraints  and | CO4 | 8 |
| b. | Write short notes on linear programming problem. | CO4 | 8 |
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| 5. | a. | Discuss in detail the Simple hill climbing algorithm with suitable example. | CO4 | 8 |
| b. | Decribe the Simulated annealing algorithm for the optimization problem. | CO4 | 8 |
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| 6. | a. | Discuss any FOUR defuzzification methods. | CO3 | 8 |
| b. | With suitable case study, explain fuzzy logic controller. | CO3 | 8 |
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| 7. | a. | With a neat flow chart, explain the operation of a simple genetic algorithm. | CO5 | 8 |
| b. | Two fuzzy relations are given by  Obtain fuzzy relation T as a composition between the fuzzy relations. | CO3 | 8 |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Write the MATLAB program for maximizing f(x)= using GA, where x ranges form 0 to 31. Perform 5 iterations only. | CO6 | 15 |
| b. | Mention the applications of genetic algorithm. | CO6 | 5 |