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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EI3015** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SYSTEM IDENTIFICATION AND ADAPTIVE CONTROL** | **Max. marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Write short notes on:  Sine wave testing | CO1 | 7 |
| b. | Frequency analysis by the correlation method | CO1 | 7 |
| c. | Weighting Function | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | Narrate the sources and causes for the existence of disturbances. | CO1 | 5 |
| b. | What is meant by pseudolinear regression ? | CO1 | 5 |
|  | c. | Explain the modeling concept involved in noise representation and time-invariant kalman filter. | CO1 | 10 |
| 3. | a. | Discuss the various types of models and their criterion of classification. | CO1 | 10 |
|  | b. | Obtain the state space model of a dc servo motor. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | What are fuzzy models? Illustrate with an example.(5) | CO1 | 5 |
|  | b. | Write the principle of Least square Estimation.(5) | CO2 | 5 |
|  | c. | State and prove least square estimation theorem.(10) | CO2 | 10 |
| 5. | a. | Differentiate between static and dynamic plant transfer function. | CO2 | 5 |
|  | b. | Compare the features of inverse feed forward and feedback neural control with a block diagram. | CO2 | 5 |
|  | c. | Explain the concept of back propagation algorithm used in Neural Network for system validation | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | List the statistical properties of Least Squares estimation | CO2 | 5 |
|  | b. | Derive the recursive least square estimation algorithm. | CO2 | 10 |
|  | c. | State the Recursive Least Square Estimation | CO2 | 5 |
| 7. | a. | Explain the Specialized on-line learning control architecture for static and dynamic plant. | CO3 | 10 |
|  | b. | Draw the various Neural Network Configurations applied for plant Identification and compare its features. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Compare the features of inverse feed forward control and feedback control with a block diagram. | CO3 | 10 |
|  | b. | Explain the concept of back propagation algorithm used in Neural Network for system Identification. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Draw the general block diagram of adaptive control system. | CO3 | 2 |
|  | b. | Discuss how adaptive control system is used in Heat Exchanger. | CO3 | 10 |
|  | c. | Explain the concept of self Tuning Regulator Adaptive Control System. | CO3 | 8 |

ALL THE BEST