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– 2017**

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| **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. | Outline the sources and causes for the existence of disturbances. | CO1 | 5 |
| b. | Explain the modeling concept involved in noise representation and time-invariant kalman filter. | CO1 | 15 |
| (OR) | | | | |
| 2. | a. | Sketch the block diagram of Hammerstein model and explain its features. | CO1 | 10 |
| b. | Demonstrate the various types of models and their criterion of classification. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Discuss about black box models with an example. | CO1 | 10 |
| b. | Derive the state space model of a dc servo motor. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Explain the various types of models and their criterion of classification. | CO1 | 10 |
| b. | State and prove least square estimation theorem. | CO1 | 10 |
|  |  |  |  |  |
| 5. | a. | List the statistical properties of Least Squares estimation. | CO2 | 5 |
| b. | Derive the recursive least square estimation algorithm. | CO2 | 15 |
| (OR) | | | | |
| 6. |  | Illustrate the features of the various parametric transfer function models. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | Compare the features of inverse feed forward control and feedback control with a block diagram. | CO3 | 10 |
|  | b. | Outline the concept of back propagation algorithm used in Neural Network for system Identification. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Discuss how adaptive control system is used in Heat Exchanger. | CO3 | 10 |
| b. | Explain the concept of Adaptive Control System with necessary diagrams. | CO3 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Elaborate the implementation of adaptive control scheme in the distillation column. | CO3 | 10 |
| b. | Discuss how adaptive control system is used in Robotic arm. | CO3 | 10 |

ALL THE BEST