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

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

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| **Code :** | **14EI2009** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PROCESS DYNAMICS AND 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. | Describe about the Piping & Instrumentation diagram with examples. | CO1 | 8 |
| b. | Derive the mathematical model of any one first order physical system. | CO1 | 12 |
| (OR) | | | | |
| 2. | a. | Derive the mathematical model of Non-interacting two tank system. | CO1 | 15 |
| b. | Write short notes on characteristics of the Thermal systems. | CO1 | 5 |
|  |  |  |  |  |
| 3. |  | Calculate the P and PI controller output for the Given Error Signal shown in the figure. Given data are Kp=5, Ki=1 sec-1 Pi(0)=20%. | CO2 | 20 |
| (OR) | | | | |
| 4. |  | With necessary graphs and equations, describe about the working of various composite controllers in detail. | CO2 | 20 |
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| 5. | a. | Elaborate the procedure for finding the controller parameters using Cohen-Coon tuning method. | CO2 | 12 |
| b. | Describe the procedure of quarter decay ratio based controller tuning method in detail. | CO2 | 8 |
| (OR) | | | | |
| 6. | a. | Illustrate the procedure for determining controller parameters using Ziegler-Nichols tuning method. | CO2 | 12 |
| b. | Explain about the Time integral performance criteria. | CO2 | 8 |
|  |  |  |  |  |
| 7. | a. | Explain the concept of Cavitation and Flashing in control valves. | CO3 | 10 |
| b. | Sketch the basic control valve and explain its working in detail. | CO3 | 10 |
| (OR) | | | | |
| 8. |  | Discuss about the working of various pneumatic actuators in detail. | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | With a neat sketch, explain the working of cascade controller in detail. | CO3 | 10 |
| b. | Describe the controls involved in Chemical Reactor with necessary diagrams. | CO3 | 10 |