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



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

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| **Code :** | **14EI2046** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PROCESS CONTROL FOR FOOD ENGINEERS** | **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. | With a suitable example, explain the design concepts involved in PID controller. | CO3 | 15 |
| b. | Write the difference between open loop and closed loop control system. | CO1 | 5 |
| **(OR)** | | | | |
| 2. | a. | Explain in detail about the construction and working of pneumatically operated control valve with neat sketch. | CO3 | 15 |
| b. | Write short note on servomechanism. | CO1 | 5 |
|  |  |  |  |  |
| 3. |  | Use Mason’s gain formula to determine the overall transfer function of the system shown in figure. | CO1 | 20 |
| **(OR)** | | | | |
| 4. |  | Determine the overall transfer function C(S)/R(S) for the system shown in figure using Block Diagram reduction rules. | CO1 | 20 |
|  |  |  |  |  |
| 5. |  | Compare the following temperature transducers:   * Thermocouple * RTD * Thermistor   Illustrate your answer by defining the output from each, stating approximate temperature ranges that can be measured and sketch the relationship between temperature and output for each transducer. Also, list one advantage and disadvantage for each device. | CO3 | 20 |
| **(OR)** | | | | |
| 6. | a. | Determine the stability of the system using Routh array method whose characteristics equation given by | CO2 | 15 |
| b. | Write the principle in measuring the level using simple float system. | CO3 | 5 |
|  |  |  |  |  |
| 7. | a. | Determine the stability of the system using Routh array method whose characteristics equation given by | CO2 | 15 |
| b. | Write short note on Primary transducer for Pressure measurement. | CO3 | 5 |
| **(OR)** | | | | |
| 8. | a. | List the Non-contact type of level transducers and explain with the neat sketch, the construction and working principle. | CO3 | 10 |
| b. | Explain the concept in measuring density using Air bubbler system and photoelectric transducer. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain in detail about the construction and working of pH meter. | CO3 | 10 |
| b. | Explain in detail about the construction and working of conductivity meter. | CO3 | 10 |