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

G:\logo and QP Template\logo 3 Feb 2018 final.tif

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

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EI2046** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PROCESS CONTROL FOR FOOD ENGINEERS** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Describe the fundamental process control system and draw the automatic process control system with example. | CO3 | 15 |
| b. | Discuss in detail about on-off controller with suitable example. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Explain the block diagram of open loop and closed loop control system and explain the same with illustrative example. | CO1 | 15 |
| b. | Give the difference between hydraulic and pneumatic systems. | CO1 | 5 |
|  |  |  |  |  |
| 3. | a. | Explain the servomechanism with neat sketch. | CO3 | 15 |
| b. | Explain the design concepts involved in PID controller. | CO2 | 5 |
| (OR) | | | | |
| 4. | a. | Use Mason’s gain formula for determining the overall transfer function of the system show in figure. | CO2 | 15 |
| b. | List the basic properties of signal flow graph. | CO2 | 5 |
|  |  |  |  |  |
| 5. | a. | With relevant diagram explain the construction and working of pneumatically operated control valve. | CO3 | 15 |
| b. | Write short note on derivative control. | CO2 | 5 |
| (OR) | | | | |
| 6. | a. | Construct Routh array and determine the stability of the system represented by the characteristic equation, s7+5s6+9s5+9s4+4s3+20s2+36s+36=0. Comment on the location of the roots of characteristic equation. | CO2 | 15 |
| b. | Discuss the necessary condition for stability. Explain the relation between stability and coefficient of characteristic Polynomial. | CO2 | 5 |
|  |  |  |  |  |
| 7. | a. | Determine the overall transfer function C(S)/R(S) for the system shown in figure using Block Diagram reduction rules. | CO2 | 15 |
| b. | Give any five rules of Block Diagram Reduction. | CO2 | 5 |
| (OR) | | | | |
| 8. | a. | List the Non-contact type of level transducers and explain with the neat sketch, the construction and working principle. | CO3 | 15 |
| b. | Explain the construction and working of capacitive pressure transducer. | CO3 | 5 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Explain in detail about the construction and working of pH meter. | CO3 | 15 |
| b. | With the neat diagram explain about Gas Chromatography. | CO3 | 5 |