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



**End Semester Examination – Nov/Dec– 2017**

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| **Code :** | **14EI2048** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INSTRUMENTATION AND CONTROL SYSTEMS** | **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. | [Draw the block diagram representation of a generalized measuring system, identify t](http://www.annauniversityplus.com/)he [various elements and point out the function performed by each element.](http://www.annauniversityplus.com/) | CO1 | 15 |
| b. | Define error and list the types of error. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Describe the construction and working of XY recorder? | CO1 | 15 |
| b. | How galvanometer can be converted into an ammeter? | CO1 | 5 |
|  |  |  |  |  |
| 3. | a. | Describe briefly the construction and working of load cell for measurement of pressure. | CO1 | 15 |
|  | b. | Sketch and explain the working principle of integrating instrument. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | Enumerate the principle of operation of RTD. | CO1 | 15 |
|  | b. | Explain how the Wheatstone bridge circuit may be utilized for the measurement of temperature. | CO1 | 5 |
|  |  |  |  |  |
| 5. | a. | With relevant diagram explain the different types of strain gauge. | CO1 | 15 |
|  | b. | Summarize the characteristics of gauge factor and explain its significance? | CO1 | 5 |
| (OR) | | | | |
| 6. | a. | Discuss the principle of hot wire anemometer for constant current method. | CO1 | 15 |
|  | b. | Describe the working principle of electromagnetic flow meter. | CO1 | 5 |
|  |  |  |  |  |
| 7. | a. | Use Mason’s gain formula for determining the overall transfer function of the system show in Fig. | CO3 | 15 |
|  | b. | Discuss open loop and closed loop control system with example? | CO3 | 5 |
| (OR) | | | | |
| 8. | a. | Construct Routh array and determine the stability of the system represented by the characteristic equation, S5+S4+2S3+2S2+3S+5=0. Comment on the location of the roots of characteristic equation. | CO2 | 15 |
|  | b. | Find the type and order of the following system transfer function  i.  ii. | CO2 | 5 |
|  | | **Compulsory:** |  |  |
| 9. | a. | The open loop transfer function of a unity feedback control system is given by. Sketch the polar plot and determine the phase margin and gain margin. | CO2 | 15 |
|  | b. | Reduce the block diagram shown in the figure and find the transfer function. | CO2 | 5 |

ALL THE BEST