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 – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **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. | Describe the Fundamental measurement Process and draw the block diagram of generalized measurement system with example. | CO1 | (15) |
| b. | Define error and list the types of error. | CO1 | (5) |
| (OR) | | | | |
| 2. | a. | What is recorder? How it is classified? Explain the working of X Y recorder? | CO1 | (15) |
| b. | How galvanometer can be converted into a voltmeter? | CO1 | (5) |
| 3. | a. | Explain briefly the construction and working of bourdon tubes for measurement  of pressure. | CO1 | (15) |
|  | b. | Explain briefly the integrating Instrument with example. | CO1 | (5) |
| (OR) | | | | |
| 4. | a. | Explain briefly the construction and working of a Thermocouple. | 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. | Explain how weight Measured using Strain Gauge. |  | (5) |
| (OR) | | | | |
| 6. | a. | With neat diagram explain the construction and working of Hot-wire anemometer. | CO1 | (15) |
|  | b. | Explain the ultrasonic flow meter using the travel time difference method. | CO1 | (5) |
| 7. | a. | Find the overall transfer function of the system for the signal flow graph shown below. | CO3 | (15) |
|  | b. | What are the basic properties of signal flow graph? | CO3 | (5) |
| (OR) | | | | |
| 8. | a. | Construct Routh array and determine the stability of the system represented by the characteristic equation, s6+2s5+8s4+12s3+20s2 +16s+16=0.Comment on the location of the roots of characteristic equation. | CO2 | (15) |
|  | b. | What is the necessary condition for stability? Explain the relation between stability and coefficient of characteristic Polynomial. | 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. | Find the type and order of the following system transfer function  (i)  (ii) | CO2 | (5) |

ALL THE BEST