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

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**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 :** | **10ME202/ME256** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **INSTRUMENTATION AND CONTROL SYSTEMS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Classify measurement error. | (1) |
| 2. | What are auxiliary fundamental units? | (1) |
| 3. | Define Sensor. | (1) |
| 4. | Give the applications of a Thermocouple. | (1) |
| 5. | Classify flow meters. | (1) |
| 6. | List any two types of pressure gauges. | (1) |
| 7. | Dynometer is used for measurement of torque. True/False | (1) |
| 8. | What is the use of a Wheatstone bridge circuit? | (1) |
| 9. | The transfer function of a system is . The input to this system is ramp signal. The error in  the output would be \_\_\_\_\_\_\_\_\_\_. | (1) |
| 10. | In control system, servomechanism is used for system dealing with \_\_\_\_\_\_\_\_\_\_\_\_\_\_ control. | (1) |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11. | Define the following terms a. precision b. accuracy. | (3) |
| 12. | Give the principle of operation of piezo electric transducers. | (3) |
| 13. | What is Reynolds number? How is it used to find out the flow? | (3) |
| 14. | What are factors to be considered for the installation of bonded strain gages? | (3) |
| 15. | Differentiate open loop and closed loop system. | (3) |

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| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. |  | What are the basic blocks of a generalized instrumentation system? Draw the various blocks and explain their functions | (15) |
| (OR) | | | |
| 17. | a. | Explain about units and standards. | (5) |
| b. | Discuss in detail the different types of errors in a measurement system. | (10) |
| 18. | a. | Explain the construction and working of resistance thermometers. | (10) |
| b. | What is lead wire compensation? Explain. | (5) |
| (OR) | | | |
| 19. | a. | Explain the principle and construction of variable inductance transducer. | (8) |
| b. | Discuss the working principle of total radiation pyrometer. | (7) |
| 20. | a. | Discuss about the C – Type bourdon gauge with a neat sketch. | (8) |
| b. | With a neat sketch explain the working of a variable area flow meter. | (7) |
| (OR) | | | |
| 21. |  | With a neat sketch explain the construction details and working principle of a Mcleod gauge. | (15) |
| 22. | a. | Explain in detail, the principle and operation of strain gauge and derive the expression for gauge factor. | (15) |
| (OR) | | | |
| 23. |  | Write notes on the following:  a. Hair hygrometer.  b. Geiger Muller counter. | (15) |
| 24. |  | The block diagram of a closed loop system is shown in the figure. Using the block diagram reduction technique determine the closed loop transfer function C(s)/R(s). | (15) |
| (OR) | | | |
| 25. |  | For the following transfer function 20/s(1+3s)(1+4s) draw the bode plot and obtain the cross over frequency. | (15) |

ALL THE BEST