**R09**

**Code No: C8009**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**M.Tech I - Semester Examinations, March/April-2011**
**INSTRUMENTATION AND SENSOR TECHNOLOGY**
**(MECHATRONICS)**

**Time: 3hours** **Max. Marks: 60**

**Answer any five questions**
**All questions carry equal marks**
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1. (a) What is a measurement system? Explain with the help of a block diagram.
   (b) Explain with a neat sketch the Electro-Mechanical systems for measurement of temperature. [6+6]

2. Explain briefly about the types of errors involved in measurement systems by giving suitable examples. Discuss the means adopted to reduce these errors. [12]

3. (a) Distinguish between static pressure and stagnation pressure.
   (b) What are the instruments used for measurement of low pressure and low vacuum pressure.
   (c) Explain with neat sketch the principle of working of McLeod Gauge. [4+4+4]

4. (a) Explain the method of measuring force using strain gauges?
   (b) Why bridge circuit is necessary for a strain gauge? Explain how the bridge circuit is used with a strain gauge. [6+6]

5. (a) Draw a neat sketch of an ionization gauge. Explain the working principle of the gauge.
   (b) List merits and limitations of ionization gauges. [6+6]

6. (a) Explain operation of ionization transducer with a neat sketch and write the applications.
   (b) Describe the construction and principle of LVDT and its applications [6+6]

7. (a) Explain the functioning of ultrasonic flow meter with a neat diagram.
   (b) With a neat diagram, explain the working of turbine flow meter and point out its limitations. [6+6]

8. A common example of a two-input control system is a home shower with separate valves for hot and cold water. The objective is to obtain
   i. a desired temperature of the shower water and
   ii. a desired flow of water

   Sketch a block diagram of the closed loop control system. Discuss the salient feature of this multivariable control system. [12]

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