**R09**

**Code No: D6403**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**
**M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012**
**INSTRUMENTATION**
**(POWER ENGINEERING AND ENERGY SYSTEMS)**

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

**Answer any five questions**
**All questions carry equal marks**

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1. a) Explain about static and dynamic characteristics of instruments, bringing out the differences between the terms, giving examples.
   b) Giving examples for I order and II order systems, explain about their frequency response characteristics.

2. a) With the help of a neat sketch explain the principle and working of LVDT. What are its applications?
   b) Draw the circuit for feedback type capacitive transducer and derive the expression for output voltage '$e_0$'.

3. a) State the laws of Thermocouples. Explain about different types of Thermocouples used in different temperature ranges.
   b) Draw the schematic and explain the working of Dual slope integrating type ADC. What are its salient features? Explain.

4. a) Explain about the principle and working of RZ and NRZ type magnetic tape recorders.
   b) Explain the working principle of Ionization gauge. What are its applications?

5. a) Draw the block diagram of a Computer Controlled Measuring System and explain its operation.
   b) What is the principle of Fibre optic transducers? Explain their operation with the help of sketches.

6. a) Explain the principle and working of Liquid level float measuring systems. Derive the necessary equations.
   b) What are the materials used for Thermistors? What is the principle of Thermistors? Draw the characteristic. How linearization can be done?

7. a) What is the principle of charge amplifier? Explain. What are the applications of charge amplifiers?
   b) Draw the sketch and explain the working of optical pyrometer.

8. Write note on any **TWO**:
   a) Level to pressure converters
   b) Tachometers
   c) D/A Converters.

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