

2008 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**III B.TECH SUPPLEMENTARY EXAMINATIONS
INSTRUMENTATION AND CONTROL SYSTEM
(MECHATRONICS)**

AUG/SEP 2008

TIME : 3 HR
MARK : 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) What are the different standard inputs for studying the dynamic response of a system. Define and sketch them.

(b) A thermometer has a time constant of 3.44. It is quickly taken from a temperature 00C to a water bath having a temperature 1000C. what temperature will be indicated after 1.55?
2. (a) Describe the different methods used for measurement of speed; describe their advantages and disadvantages.

(b) Explain the construction, working and theory of a drag cup type tachogenerator.
3. (a) List all industrial thermocouples giving their elements and temperature ranges.

(b) Why cold junction compensation is required? Explain an automatic cold junction compensation method.
4. (a) Describe different sources of errors in U-tube manometer and how corrections can be applied to minimize these errors.

(b) Explain how sensitivity can be increased by using inclined tube manometer. Describe its construction, advantages and limitations.
5. (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. (a) How seismic instruments are used for measuring acceleration. Explain in detail.

(b) What is the importance of humidity control in process industries?
7. (a) Mention the important requirements for a strain gauge material. Name some of the materials used for making strain gauges.

(b) How resistive strain gauges are calibrated?
8. (a) Describe the working of a system which automatically turns off the street lamps at dawn and turns on at dusk. Draw a schematic diagram of the system.

(b) Draw the functional diagram of thermostat controlled home heating system and identify the system parameters and components. Describe the working of the system.