

III B.Tech II Semester Supplementary Examinations, April/May 2005
INSTRUMENTATION AND CONTROL SYSTEMS
 (Common to Mechanical Engineering, Mechatronics and Production Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Describe about the step response of second order system.
- (b) A response test on a thermometer was thrust into temperature controlled bath of water maintained at 100°C and the time was observed as the indicated temperature reached preselected values giving the following readings.

Times(sec)	0.0	1.2	3.0	5.6	8.0	11.0	15.0	18.0
Temp(deg c)	20	40	60	80	90	95	98	99

Draw the response curve on a graph paper and show that it follows closely the form of a simple lag with a time constant of 4 secs.

2. (a) List the different types of speed-measuring devices. Explain with neat sketches, the construction and working of any two of them.
- (b) Write short note on the Tachogenerators.
3. (a) Explain thermocouple protection materials and for what range they are used.
- (b) Explain the construction and working of
 - i. Constant intensity optical pyrometer.
 - ii. Variable intensity optical pyrometer.
4. (a) Compare and contrast between pirani gauge and Thermocouple type conductivity gauge.
- (b) Define gauge pressure show three different constructions of elastic pressure sensing elements. Assuming that the stresses in a metallic diaphragm are linearly proportional to stress applied to the diaphragm
5. (a) List out the advantages and limitations of direct method of level measurement.
- (b) Describe with neat sketch the functioning of any two types of displacer type liquid level measuring instruments.
6. (a) Explain the working of servo accelerometer with neat sketch.
- (b) How absolute humidity is measured?
7. (a) Draw a neat sketch and explain the working of unbonded resistance type strain gauge.

- (b) Give the applications of unbonded strain gauges.
 - (c) List the drawbacks of bonded type strain gauges.
8. Write short notes on the following:
- (a) Servomechanism
 - (b) Temperature control system
 - (c) Position control system

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