Code: 9A10501

R9

B.TECH III Year I Semester (R09) Supplementary Examinations, May 2012

SENSORS AND SIGNAL CONDITIONING

(Common to E.Con.E and EIE)

Time: 3 hours Max Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 (a) Derive the equations for time response of a first order system when subjected to:
(i) Step input.
(ii) Unit ramp input. Draw the response curves and find the steady state errors in each case.
(b) What are the loading effects under dynamic conditions? How are they minimized?

2 (a) Define the gauge factor of a strain gauge and derive its expression.
(b) Explain the construction, working and applications of magnetoresistor.

3 (a) Draw the block diagram of a DC signal conditioning system and explain the operation of each block.
(b) An equal arm bridge has R=10 k ohms. The supply voltage to the bridge is 30 V. An amplifier with a gain of 26 dB is connected across the output. Find the change in output voltage of the amplifier if resistance change in one of the arm is 500 ohms.

4 (a) Describe the construction, principle of working and applications of Hall effect transducer.
(b) Describe the operation of LVDT with relevant diagrams.

5 Explain in detail about digital to resolver converter.

6 (a) What is Seeback effect? Explain the laws of thermocouple.
(b) Explain the construction, working and applications of pyroelectric transducers.

7 (a) Explain charge amplifier and derive its output equation and frequency response.
(b) Explain in detail about electrometer amplifier.

8 (a) Write notes on magneto diodes and magneto transistors.
(b) Write short notes on photodiode and photo transistors.

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