Roll No. ..... Total Pages : 03

BT-8/D-18 38018

TRANSDUCERS AND THEIR APPLICATIONS

ECE-430E

Time : Three Hours] [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) Describe the principle, working and applications of Hall effect transducers. **10**

   (b) What is a transducer ? Explain, what is meant by active and passive transducers with examples. **10**

2. (a) Explain the difference between Primary and Secondary type of transducer. Justify your answer with the help of examples. **10**

   (b) Define the terms :

   (i) Resolution

   (ii) Sensitivity

   (iii) Accuracy

   (iv) Precision. **10**

Unit II

3. Describe the working, construction and principle of resistance thermometers. What are the materials used for the construction of RTDs ? Also discuss their properties. **20**

4. (a) A first order thermometer with a time constant of 5 sec is used to measure the temperature of a furnace fluctuating between 540° C and 580°C in a sinusoidal manner. The frequency of fluctuation is 0.04 Hz. Find the maximum and minimum readings of a thermometer. **10**

   (b) What are Manometers ? How manometers are used for the measurement of pressure ? Explain its principle of working with suitable diagrams. **10**

Unit III

5. (a) What is the different between metallic and semiconductor strain gauge ? Describe the principle of working and construction details of bonded type strain gauge. **10**

   (b) What is variable reluctance pick up ? How is it related to measurement of velocity ? **10**

6. What is the difference between inductive type and capacitive type transducers ? Give example of each type with detailed description. Also draw neat diagrams to support your answer. 20

Unit IV

7. Discuss construction and principle of working of torsion meter with details. 20

8. Explain any *four* of the following :
   (a) Strain gage load cells
   (b) Digital methods
   (c) Pneumatic load cell
   (d) Torque meter
   (e) Inductive torque transducer. 20

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