Total No. of printed pages = 3

Et-507/EI/5th Sem/2016/N

ELECTRONICS INSTRUMENTATION

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *seven* questions :

1. (a) Compare the advantages and disadvantages of the deflection and null type instruments.

   (b) Describe the major functions of instruments and measuring systems. 4+6=10

2. Describe the methods of measuring the translation and rotational motion of an object using different types of self-generating inductive transducer. 10

3. (a) What do you mean by a transducer ? What are the desirable characteristics of a transducer for its selection for a particular application ?

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(b) Describe the method for the measurement of motion of an object using potentiometric resistance type transducer. 2+3+5=10

4. (a) Describe the measurement method for measuring motion using variable inductance transducer.

(b) What is LVDT transducer ? How it can be used for the measurement of linear and rotational motion of an object. 5+5=10

5. Describe the low pressure measurement method using Pirani Gauge and Ionization Type Vacuum Gauge. 5+5=10

6. (a) What are the different types of electromagnetic tachometer generators used for the measurement of angular velocity ?

(b) With a neat sketch, describe the operation principle of a DC tachometer generator and also mention its advantages and disadvantages. 2+8=10

7. (a) Explain why the ordinary Wheatstone bridge is not used for the measurement of change in resistance in the electrical method for the temperature measurement ?

(b) Describe how the problems of measuring temperature by using Wheatstone bridge are avoided using three lead and four lead methods. 3+3+4=10

8. (a) Deriving the necessary formula, describe the operating principle of electrical resistance thermometer.

(b) A platinum resistance thermometer has a resistance of 140.5Ω and 100Ω at the 100°C and 0°C respectively. If its resistance becomes 305.3 Ω when it is in contact with a hot gas, determine the temperature of the gas. The temperature co-efficient of platinum is $0.0039°C^{-1}$. 6+4=10

9. What are the different types of Opto-Electrical Transducer ? Discuss each of them. 10