Printed Pages—3

EEE504/EEN 701

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2114 Roll No. | | | | | | | | | | |

12736

B.Tech.

(SEM. V) ODD SEMESTER THEORY EXAMINATION 2012-13

ELECTRICAL INSTRUMENTATION AND PROCESS CONTROL

Time : 3 Hours *Total Marks : 100*

Note :– Attempt **all** questions. Each question carries equal marks.

1. Attempt any **four** parts of the following : **(5×4=20)**

   (a) Differentiate between the following with suitable example :

   (i) Active and passive transducer

   (ii) Analog and digital transducer.

   (b) Explain the types of strain gauge and what do you mean by piezo resistive effect ?

   (c) A platinum resistance thermometer has a resistance of 100 Ω at 25°C. Find its resistance at 65°C. The resistance temperature Co-efficient of platinum is 0.00392 Ω/Ω–°C. If the thermometer has a resistance of 150 Ω, calculate the value of temperature.

   (d) Explain the working principle of thermistor, with suitable diagram and give the applications.

(e) Write the advantages and disadvantages of LVDTs and also write the use of LVDTs.

(f) The output of an LVDT is connected to a 5 V voltmeter through an amplifier whose amplification is 250. An output of 2 mV appears across the terminals of LVDT when the core moves through a distance of 0.5 mm. Calculate the sensitivity of the LVDT and that of the whole set up. The milli voltmeter scale has 100 divisions. The scale can be read to 1/5 of a division. Calculate the resolution of the instrument in mm.

2. Attempt any **four** parts of the following : **(5×4=20)**

(a) Explain working principle of piezoelectric transducer with diagram.

(b) Define the following terms :

(i) Gauge pressure

(ii) Differential pressure

(iii) Absolute pressure

(iv) Velocity pressure.

(c) Explain construction and working principle of float-type level indicator.

(d) What is role of Reynold's number in the accurate determination of flow ?

(e) An Hall effect element used for measuring a magnetic field strength gives an output voltage 10 mV. The element is made of silicon and is 3.0×10^{-3} m thick and carries a current of 2 amp. The Hall co-efficient is 4.1×10^{-6} Vm/A–wb/m^2. Find magnetic field strength (β).

(f) Describe capacitive transducer with diagram.

3. Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain hand line telemetering system. Describe the torque balance telemetering system.

(b) Describe the modern digital data acquisition system.

(c) Describe the different types of channels used for telemetry. Explain their advantages and disadvantages.

4. Attempt any **two** parts of the following : **(10×2=20)**

(a) Explain Pneumatic Controllers with neat diagram.

(b) What is a PLC ? Explain its applications with examples.

(c) Describe the principle of the following composite controller.

5. Attempt any **two** parts of the following : **(10×2=20)**

(a) What is the role of display devices and recorder in industry ?

(b) Describe different types of optical fibre sensors.

(c) What is spectrum analyzer ? Differentiate with some points of audio frequency and radio frequency at analyzers.