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

PAPER ID : 3096 Roll No.

B.Tech

(SEM V) ODD SEMESTER THEORY EXAMINATION 2009-10

TRANSDUCERS, SENSORS AND DISPLAY SYSTEMS

Time : 3 Hours] *[Total Marks : 100*

Note : *Attempt all the questions.*

1 Answer any **four** of the following : 5×4

(a) What are the basic blocks of a Generalized Instrumentation system ?

(b) Explain the phenomenon of hysteresis in measurement systems.

(c) Differentiate between the terms "Scale Range" and "Scale Span" giving suitable examples.

(d) Define 'passive and active' transducers and give an example of each.

(e) Define 'drift', 'threshold value', and 'dead band' of a measuring system and give an example for each.

(f) Explain the analog and digital modes of operation of instruments.

2 Attempt any **four** parts of the following : 5×4

(a) Explain the operating principle of an LVDT.

(b) What is the advantage of using differential output rather than a single output for measuring displacement ?

(c) Derive and plot frequency response of capacitive transducers.

(d) Explain any one dynamometer for shaft power measurement.

(e) Discuss frequency response of piezoelectric accelerometer.

(f) Describe variable Reluctance / FM-oscillator digital systems, briefly.

3 Attempt any **four** of the following : 5×4

(a) Explain the principle and working of optical pyrometers.

(b) Describe the construction and working of Radiation thermometers.

(c) Draw and describe voltage-current and current-time characteristics of thermistors.

(d) With different temperature range and application environment, enlist, with explanation, various types of temperature transducers.

(e) Explain the merits of a thermocouple system for the measurement of temperature, when compared with the wire resistance thermometer and the thermistor.

(f) What is a load cell ? Where is it used ?

4 Attempt any **four** of the following : 5×4

(a) How many elastic pressure transducers are there ? Explain each of them.

(b) How many types of manometers are there ?

(c) Explain with neat diagram, the working of Pirani gauge for pressure measurement.

(d) Explain liquid vapour display in detail.

(e) Draw the diagram of electro-phoretic image display and describe its working.

(f) Describe differential pressure level detector in detail.

5 Attempt any **four** parts of the following : 5×4

(a) Explain the principle of working and circuit diagram of storage oscilloscope.

(b) Describe the conductive and capacitive method for the measurement of level.

(c) Explain ultrasonic level detectors in the measurement of liquid level.

(d) Differentiate between Hot wire and Hot film anemometer.

(e) What are the relative advantage of LCD display devices over LED display devices ?

(f) Describe in brief various gas discharge plasma devices.