Code: 13A10401 **R13**

B.Tech II Year II Semester (R13) Supplementary Examinations May/June 2017

SENSORS, TRANSDUCERS & SIGNAL CONDITIONING CIRCUITS

(Electronics and Instrumentation Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Classify Sensor classifications according to different exhaustive criteria.

(b) What do you mean by zero order measurement system?

(c) What is resistance temperature detector and draw the symbols of various RTD.

(d) Draw the diagram of linear rotary differential capacitance sensor.

(e) Draw the circuit diagram of LVDT.

(f) List the advantages of LVDT.

(g) Draw the circuit of a capacitive displacement sensor based upon the variation of the separation of plates in a parallel plate capacitor.

(h) Draw the circuit diagram of Blumlein bridges.

(i) Draw the circuit diagram of an offset voltage in an op-amp-based inverting amplifier.

(j) Write the importance of signal conditioners for capacitive sensors.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Explain about static characteristics of measurement systems.

OR

3 The approximate time constant of a thermometer is determined by immersing it in a bath and noting the time it takes to reach 63% of the final reading. If the result is 28 s, determine the delay when measuring the temperature of a bath that is periodically changing 2 times per minute. Determine angular frequency and delay.

UNIT – II

4 (a) Explain the principle and operation of strain gauge.

(b) Explain measurement of pressure using inductive transducer.

OR

5 Explain the principle and operation of magneto resistors.

UNIT – III

6 Explain the principle and operation of pressure gauge.

OR

7 (a) Explain the principle and operation of thermocouple probe.

(b) On what basic principle RDTs work? Explain their construction.

UNIT – IV

8 Explain the procedures involved balance and deflection measurements in wheat stone bridge.

OR

9 Explain with a circuit diagram of an instrumentation amplifier using single and multiple op amps.

UNIT – V

10 Discuss in detail electrostatic shields in sensors.

OR

11 Discuss in detail about specific signal conditioners for capacitive sensors.

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