

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)
- Classify Sensor classifications according to different exhaustive criteria.
  - What do you mean by zero order measurement system?
  - What is resistance temperature detector and draw the symbols of various RTD.
  - Draw the diagram of linear rotary differential capacitance sensor.
  - Draw the circuit diagram of LVDT.
  - List the advantages of LVDT.
  - Draw the circuit of a capacitive displacement sensor based upon the variation of the separation of plates in a parallel plate capacitor.
  - Draw the circuit diagram of Blumlein bridges.
  - Draw the circuit diagram of an offset voltage in an op-amp-based inverting amplifier.
  - 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.