

B.Tech II Year II Semester (R13) Regular Examinations May/June 2015
SENSORS, TRANSDUCERS & SIGNAL CONDITIONING CIRCUITS
(Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

PART – A
(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- (a) Define accuracy and precision of measuring instruments.
 - (b) Explain Hall Effect.
 - (c) Compare primary and secondary transducers.
 - (d) Derive the expression for frequency response of a first order system.
 - (e) What are the applications of thermocouples?
 - (f) Define transducer.
 - (g) Write short notes on isolation amplifiers.
 - (h) Discuss about measurement of resistance.
 - (i) Discuss about charging amplifier.
 - (j) Discuss about chopper amplifier.

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

UNIT – I

- 2 (a) Explain about static characteristics of a measurement system.
(b) Define sensor and give classification of sensors.

OR

- 3 (a) Explain about dynamic characteristics of a measurement system.
(b) Derive the expression for frequency response of a second order system. Draw the magnitude and phase versus frequency plots for damping ratio smaller than 0.707.

UNIT – II

- 4 (a) Draw and explain about strain gauge.
(b) Discuss the working of LVDT with necessary diagrams.

OR

- 5 (a) Discuss about capacitive sensors applications.
(b) Explain measurement of pressure using inductive transducer.

UNIT – III

- 6 (a) What are RTD's and on what basic principle do they work? Explain their construction.
(b) Draw and explain the operation of thermocouples.

OR

- 7 (a) With a neat sketch explain the operation of pressure gauge.
(b) With a neat sketch explain the operation of pressure transmitter.

UNIT – IV

- 8 (a) Explain the operation of OP-AMP based differential amplifier.
(b) Write short notes on sensor bridge calibration and balance.

OR

- 9 (a) With a schematic diagram explain the operation of OP-AMP based instrumentation amplifier.
(b) Explain Wheatstone bridge with a neat sketch.

UNIT – V

- 10 (a) Write short notes on offset and drifts in OP-AMP.
(b) With a schematic diagram explain the operation of trans impedance amplifier.

OR

- 11 (a) Write short notes on DC and AC bridges.
(b) With a neat sketch explain the operation of AC/DC signal converters.
