

YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY, FARIDABAD
B.TECH FIFTH SEMESTER EXAMINATION, MAY-2018
TRANSDUCERS AND SIGNAL CONDITIONING
SUBJECT CODE: EIC-301, SCHEME-2010

M.Marks : 60

TIME : 3 hours

Note : Part I is compulsory. Attempt any four questions from Part II.

PART I

Q.No.1

- a. Compare primary and secondary transducers?
- b. What is loading effect?
- c. Explain the working principle of strain gauge.
- d. Explain the characteristics of piezoelectric transducers.
- e. State the application of capacitive transducers?
- f. Give examples of active and passive filters.
- g. Why is calibration required for measuring instrument?
- h. Explain the ideal characteristics of Opamp.
- i. Differentiate between voltage sensitive and current sensitive bridge.
- j. What is the input/output configuration of measuring elements?

[2*10]

PART II

Q.No.2 (a) Explain various types of measurement methods and also classify measuring instruments.

(b) With neat circuit explain the operation of Successive approximation A/D converter using op-amp.

[5*2]

Q.No.3(a) Explain the construction and working of Photo transistor.

(b) A capacitive transducer uses two quartz diaphragms of area 630 mm^2 separated by a distance of 3 mm. A pressure of 750 kN/m^2 when applied to the top diaphragm produces a deflection of 0.3 mm. The capacitance is 300 pF, when no pressure is applied to the diaphragms. Find the value of capacitance after the application of a pressure of 850 kN/m^2 .

[5*2]

Q.No.4(a) Explain the concept and methods of voltage to frequency conversion.

(b) Explain with diagram, the bounded and unbounded type of strain gauges. For bounded strain gauges, describe the materials used for base, and adhesive materials and also the materials used for lead.

[5*2]

Q.No. 5(a) What is inductive transducer? Discuss how it is used in pressure measurement.

(b) Draw and explain the measurement of angular velocity using tachogenerator.

[5*2]

Q.No.6(a) Explain the principle of piezoelectric transducer. What are the materials used for it?

(b) Describe the construction and working principle of thermocouple.

[5*2]

Q.No.7 Write short note on:

- a) Fiber optic sensor
- b) choppers

[5*2]