

TED (15) – 3214
(REVISION — 2015)

Reg. No
Signature

THIRD SEMESTER DIPLOMA EXAMINATION IN INSTRUMENTATION
ENGINEERING — APRIL, 2017
INSTRUMENT TRANSDUCERS

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Define a Passive Transducer.
2. Give the expression for Gauge factor and explain each terms.
3. List out any two applications of variable capacitive transducer.
4. Define Piezo electric Effect.
5. Define MEMS.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* questions from the following. Each question carries 6 marks.

1. A strain gauge with a gauge factor of 2 is bonded to structural member is subjected to 500 micro strains. What will be the change is resistance, if the element is having a resistance of 200 Ohms ?
2. Describe loading effect in a potentiometer.
3. Explain the working of a RVDT.
4. Explain the working principle of an eddy current transducer.
5. Illustrate the working of a parallel plate capacitor.
6. Explain the working of a Photo emissive cell.
7. Explain how a radioactive gauge can be used for vacuum measurement.

(5 × 6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks)

UNIT — I

- III (a) Explain in details about the linear potentiometer and write expression for sensitivity. 8
- (b) Explain the principle of strain gauge and derive expression for gauge factor. 7

OR

- IV (a) List out advantages and disadvantages of Semiconductor Strain Gauges. 8
- (b) Explain the construction and working of a unbonded Semiconductor Strain Gauges. 7

UNIT — II

- V (a) Illustrate the working of a magnetoresistive transducer. 7
- (b) Explain the working principle of inductive transducer. Also list out different types with neat diagrams. 8

OR

- VI (a) List out advantages of LVDT. 8
- (b) Explain the working of a Variable reluctance transducer. 7

UNIT — III

- VII (a) Explain the working principle of a Photo voltaic Cell. 7
- (b) Explain working of a Photo transistor with a diagram. 8

OR

- VIII (a) Explain how we can employ a piezo electric transducer for pressure measurement. 7
- (b) Explain the working principle of a Photo conductive Cell. 8

UNIT — IV

- IX (a) Explain the construction and operation of a Solid state transducers for radiation. 8
- (b) Describe working of a Gieger Muller Counter with a diagram. 7

OR

- X (a) Sketch Schematic diagram of a Scintillation Counter and explain its working. 8
- (b) Explain how we can use a radiation detector for measuring the thickness of an object. 7