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**END SEMESTER EXAMINATION – 2021**

Semester : 5th (New Syllabus)

Subject Code : Et-507

**ELECTRONICS INSTRUMENTATION**

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks  
for the questions.

**Instruction :**

- All questions of PART – A and PART – B are compulsory.

**PART – A**

**Marks – 25**



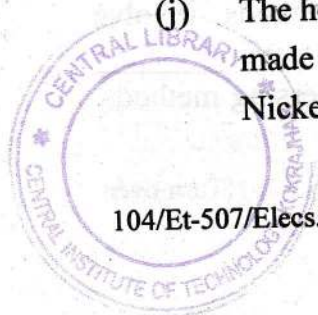
1. Fill in the blanks :

1×10=10

- (a) The resistance of the metal \_\_\_\_\_ with temperature.
- (b) Most of the indirect methods involve electrical techniques as they have \_\_\_\_\_ speed and also simple processing methods.

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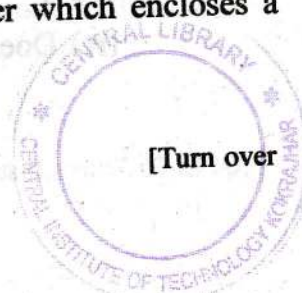
- (c) The primary sensing element is also known as \_\_\_\_\_.
- (d) Transducer is a device that converts variations in a physical quantity, such as pressure or brightness, into an \_\_\_\_\_, or vice versa.
- (e) Operation of Pirani gauge depends on the variation of \_\_\_\_\_ of a gas with pressure.
- (f) Diaphragm is a \_\_\_\_\_ transducer.
- (g) Thermistors are fabricated from the \_\_\_\_\_ materials.
- (h) Strain is defined as the displacement and \_\_\_\_\_ that occur.
- (i) In case 1 of LVDT, when the core is at null position i.e., \_\_\_\_\_ displacement.
- (j) The heated Pirani sensor filament is typically made of a thin less than \_\_\_\_\_ Tungsten, Nickel or Platinum wire.



2. Write true or false : 1×10=10

- (a) Primary sensing element is one of the main functional elements of a measuring system.
- (b) Pirani gauge is used to measure the pressure of 10<sup>-8</sup> mm of Hg.
- (c) Barium Titanate may be used as a piezo-electric transducer.
- (d) In LVDT type transducer soft iron core provides magnetic coupling between primary and secondary coils.
- (e) Types of Transducer based on the principle of Operation Photovoltaic.
- (f) Active transducers are those which require any power source for their operation.
- (g) A transducer should have good resolution over its entire range of operation.
- (h) Apart from low static error transducers should have a high non linearity.
- (i) A Pirani gauge chamber which encloses a Nickel filament.

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- (j) The most serious problem in using an ionization gauge is that it requires electron emission into a space that is not a perfect vacuum.

3. Choose the correct answer :  $1 \times 5 = 5$

(a) Electromagnetic tachometer generators are used for measurement of

- (i) vibrations
- (ii) linear velocity
- (iii) angular velocity
- (iv) acceleration

(b) Seismic accelerometer is used for the measurement of

- (i) velocity
- (ii) acceleration
- (iii) temperature
- (iv) pressure

(c) In AC tachometer generator the magnet is

- (i) fixed
- (ii) moving
- (iii) partially fixed
- (iv) Does not matter





- (d) Piezo-electric accelerometers are useful for
- (i) low frequency
  - (ii) high frequency
  - (iii) all frequencies
  - (iv) None of these
- (e) The DC tachometer works on the principle that when the closed conductor moves in the
- (i) magnetic field
  - (ii) electric field
  - (iii) Both (i) and (ii)
  - (iv) None of these.

PART - B

Marks - 45

4. Define Transducer in details. Also explain the working principles of LVDT in details. 4+5=9
5. Explain the working principle of Photoelectric Transducer. Also differentiate between Piezo-electric Transducer and Photoelectric Transducer. 6+3=9
6. How can Piezo-electric Transducer be used to measure the developed potential inside it and pressure imposed on it ? Explain Pirani Gauge process in details. 4+5=9



7. Explain in details about Drag-cup tachometer. Also differentiate between DC tachometer and AC tachometer. 6+3=9
  
8. Explain the working principles of Radiation pyrometer. Also differentiate between Radiation pyrometer and Optical pyrometer. 6+3=9

