

Total No. of printed pages = 7

RETEST EXAMINATION – 2022

Semester : 5th

Subject Code : Et-507

ELECTRONICS INSTRUMENTATION

Full Marks – 70

Time – Three hours

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

Instructions :

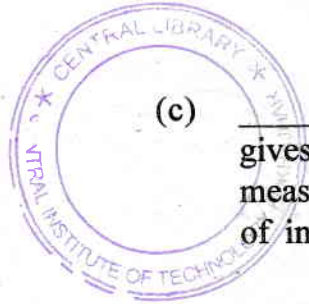
1. *All* questions of PART–A are compulsory.
2. Answer any *five* questions from PART–B.

PART – A

Marks – 25

1. Fill in the blanks : 1×10=10
 - (a) The resistance of the metal _____
with temperature.
 - (b) Measurements involve the use of instrument
as a physical means of determining _____.

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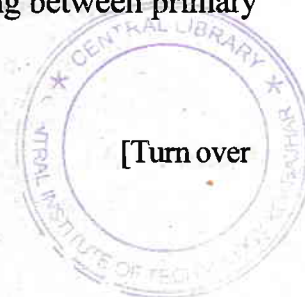
- (c) _____ is the instrument which gives the magnitude of the quantity under measurement in terms of physical constant of instruments.
- (d) In a Deflection type instrument, the value of measured quantity depends upon the _____ of the instrument.
- (e) The accuracy of Deflection type instrument is _____ than that of the Null type instrument.
- (f) Transducer should have _____ impedance.
- (g) The quantity under measurement makes its first contact with the _____ sensing element.
- (h) Thermistors are fabricated from the _____ materials.
- (i) Turbine flow meters are _____ flow meters.
- (j) In Inductive Transducer, the output voltage of the coil is proportional to the _____ of eddy current.

2. Write true or false : 1×10=10

- (a) In control of processes and operation the output variable to be controlled is non-electrical.
- (b) Null type instrument is more sensitive than Deflection type instrument.
- (c) For dynamic measurement null type instrument is more suitable than deflection type instrument.
- (d) Primary sensing element is one of the main functional elements of a measuring system.
- (e) Wire-wound potentiometer may be used as a transducer for converting mechanical displacement to an electrical output.
- (f) In self-generating types inductive transducer current signal is generated in transducer.
- (g) Non self-generating type inductive transducer no external source is required
- (h) In LVDT type transducer soft iron core provides magnetic coupling between primary and secondary coils

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(3)



- (i) Barium Titanate may be used as a Piezo-electric transducer.
- (j) A photo conductive material changes its resistance due to a change in the intensity of the incident light.

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

(a) In Photo voltaic Transducer, voltage output is generated due to

- (i) vibrations
- (ii) linear velocity
- (iii) angular velocity
- (iv) incident of light

(b) The measurement of pressure can be done by converting the pressure into

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

(c) The operation of Pirani gauge depends on variation of the

- (i) Thermal conductivity with velocity
- (ii) Thermal conductivity with pressure
- (iii) Thermal conductivity with temperature
- (iv) None of the above

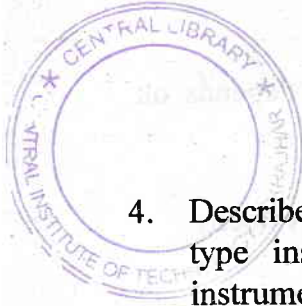
(d) Moving coil type Transducer for velocity measurement where voltage generated in the coil is proportional to the

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

(e) Seismic accelerometer is used for measuring

- (i) pressure (ii) acceleration
- (iii) velocity (iv) None of these.





PART – B

Marks – 45

4. Describe the measurement technique of a deflection type instrument (PMMC type) and null type instrument (DC potentiometer type) 4+5=9
5. (a) What are the desirable characteristics of a transducer for its selection for a particular application ? 5
- (b) What are the main factors for the selection of motion transducer ? 4
6. (a) Describe the measurement method for measuring motion using variable inductance transducer. 4
- (b) What is LVDT transducer ? How it can be used for the measurement of linear and rotational motion of an object 1+4=5
7. (a) What do you mean by Capacitive type transducer ? Point out the main differences between capacitive type transducer and piezoelectric transducer. 1+4=5
- (b) Explain Photo-emissive Transducer in details. 4

8. What are the different types of Opto-Electrical Transducer ? Discuss each of them. 9
9. Describe the low pressure measurement method using Pirani Gauge and Ionization type vacuum gauge. 5+4=9
10. With the help of necessary sketch explain the operation principle of Drag Cup Rotor AC tachometer and also write the advantages and disadvantages of it. 9
11. (a) Explain Photoelectric Tachometer in details with its diagram. 4
- (b) Describe Piezoelectric type Accelerometer along with its features. 5

