SEAT No._____

Sardar Patel University

[60]

B.Sc. (semester-III) CBCS Examination June2022 (NC)
Subject Code: US03EELE02
Subject: Instrumentation
Date: 14/6./2022; Tuesday
Time: 12:00 pm to 2:00 pm

Maximum Marks: 70

Q-1   **Multiple Choice Questions.**   **(10)**

1. _____ is used for manipulating/processing the output of the transducer in a suitable form.
   a) data presentation   b) signal conditioning
   c) calibration element   d) Transducer

2. A device for determining the voltage or magnitude of a quantity or variable is called as _____.
   a) error   b) Resolution
   c) Accuracy   d) Instrument

3. The _____ errors are due to unknown causes and occur even when all systematic errors have been accounted for.
   a) Random error   b) Dynamic error
   c) Gross error   d) None

4. _____ for giving the information about the measured variable in quantitative form.
   a) data presentation   b) signal conditioning
   c) calibration element   d) Transducer

5. Current gain of the amplifier is given by _____.
   a) output power / input power   b) output voltage / input voltage
   c) output current / input current   d) none

6. 1 Hecto is equivalent to _____.
   a) 10^2 b) 10^4
   c) 10^9 d) 10^{12}

7. 1 atto is equivalent to _____.
   a) 10^{18} b) 10^{09}
   c) 10^{06} d) 10^{03}

8. In an Ayrton galvanometer the resistor are connected in a _____.
   a) Series   b) parallel
   c) series and parallel   d) none

9. 1 femto is equivalent to _____.
   a) 10^{-15} b) 10^{-12}
   c) 10^{-6} d) 10^{-3}

10. The other name of Ayroton galvanometer is _____.
    a) universal   b) Suspension
    c) PMMC   d) Arsenol

Q-2   **Do as Directed. (Fill in the blanks and True/False)**   **(08)**

1. _____ is a deviation from the true value of the measured variable.

2. _____ are mainly covers human error.

3. _____ is used as a modifying element for processing the output of the transducer in a suitable form.

4. Voltmeter sensitivity is given by equation _____.

P.T.O

5. 1 Pico is equivalent to 10^{-12} (True or False)

6. 1 micro is equal to 10^{-6}. (True or False)

7. The unit of electric charge is coulomb. (True or False)

8. The equation for the develop torque ,derived from the basic law for electromagnetic torque is given as T=B*A*I*N. (True or False)

Q-3 **Answer in short. (Any Ten)** (20)

1. Explain basic functional element of a measuring system.

2. Draw the functional block diagram of Bourdon tube pressure gauge.

3. Explain self-generating types of instruments.

4. Define: Instrument and Accuracy.

5. Explain limiting errors.

6. Explain Arithmetic mean.

7. Explain Average Deviation.

8. Explain fundamental and derived units?

9. Explain international system units.

10. Draw the basic DC ammeter circuit diagram.

11. Draw the circuit diagram of Ayrton shunt.

12. Explain multirange voltmeter.

Q-4 **Answer the following question (Any Four)** (32)

1. Explain Typical application of instrument systems.

2. Explain Manually operated and Automatic types of instruments in detail with necessary diagram.

3. Explain types of errors in detail.

4. A set of independent current measurement was taken by six observers and recorded as 12.8mA, 12.2mA, 12.5mA, 13.1mA, 12.9mA, 12.4mA.
Calculate (a) the arithmetic mean
(b) the standard deviation of the readings
(c) the probable error.

5. Calculate the following example.
a) Express the density of water 62.5 lb/ft^3 in to (a) lb/in^3 (b) g/cm^3
b) A flux density in CGS system expressed as 20 Maxwell/cm^2. Calculate the flux density in lines / in^2. (1 Maxwell= 1 line)

6. Derive electric and magnetic units.

7. Draw the series type ohm meter circuit and explain it in detail.

8. Explain dc ammeter in detail with necessary circuit diagram.

— ✗ —