Total No. of Questions—**8**] [Total No. of Printed Pages—**3**

Seat No.	

[5057]-273

S.E. (Instrumentation and Control) (First Semester)

EXAMINATION, 2016

BASIC INSTRUMENTATION

(2012 PATTERN)

Time : Two Hours **Maximum Marks : 50**

N.B. **:—** (*i*) Solve Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No. **4**, Q. No. **5** *or* Q. No. **6** Q. No. **7** *or* Q. No. **8**.

(*ii*) Figures to the right side indicate full marks.

(*iii*) Neat diagrams must be drawn wherever necessary.

(*iv*) Use of calculator is allowed.

(*v*) Assume suitable data, if necessary.

1. (*a*) Draw the circuit diagram of laboratory type d.c. Potentiometer and explain its working. [6]

(*b*) Define Precision. Measurement of a single variable number of times are as follows. Calculate the precision of the fourth reading. [6]

144.8 Ω, 145.2 Ω, 144.6 Ω, 146.0 Ω, 144.9 Ω, 145.3 Ω, 145.7 Ω

P.T.O.

Or

2. (*a*) An energy meter consumes 20,000 watt-sec energy when it completes 10 revolutions. Calculate the meter constant. Also explain creeping and overload compensation error in 1 ϕ induction type energy meter. [6]

(*b*) Explain different types of errors. [6]

3. (*a*) Explain 10 : 1 probe. [6]

(*b*) A highly sensitive galvanometer can detect current as low as 1 nA used in wheatstone bridge. Each arm of the bridge has resistance of 1200 Ω. The input voltage to the bridge is 15 V. Calculate the smallest change that can be detected with certainty. The galvanometer resistance is negligible. [6]

Or

4. (*a*) In dual trace CRO explain function of the following : [6]

(*i*) Grid

(*ii*) Base

(*iii*) Post deflection acceleration section

(*iv*) Focus Anode.

(*b*) The various values at balanced condition in Schering bridge are :

R_1 = 560 Ω, C_1 = 0.01 µF, R_2 = 359 Ω, C_3 = 0.01 µF.

Calculate values of Rx and Cx as a series combination. Also calculate D factor if input frequency to bridge is 1000 Hz. [6]

5. (*a*) Explain with the help of block diagram, digital phase meter. [7]

(*b*) With neat block diagram, explain the working of digital multimeter. [6]

Or

6. (*a*) Explain the digital instrument for measurement of speed of rotating shaft of AC motor. [7]

(*b*) With neat block diagram, explain electronic KWh meter. [6]

7. (*a*) What is recorder ? Classify recorders. Explain Y-t recorder. [7]

(*b*) With suitable waveforms, explain working of resistor-diode wave shaping network. [6]

Or

8. (*a*) Draw block diagram of function generator. Explain the generation of sine, square and triangular waveforms. [7]

(*b*) Write a short note on virtual instrumentation. [6]