

**QP Code :14672****[ 3 Hours]****[ Total Marks:80**

- N.B. (1) Question No. 1 is compulsory.  
 (2) Attempt any **three** questions from remaining **five** questions.

1. Solve All:—
  - (a) Draw and explain the working of practical Q- meter circuit. 20
  - (b) Define the following terms:—
    - (i) Accuracy
    - (ii) Resolution
    - (iii) Hysteresis
    - (iv) Calibration
    - (v) Sensitivity
  - (c) Estimate the bandwidth of CRO if a signal of 12 millisecond rise time is observed as the signal with 15 millisecond rise time.
  - (d) Draw and explain the McLeod gauge for pressure measurement.
2.
  - (a) Write short note on “Programmable logic controller”. 10
  - (b) Draw and explain the turbine flow meter. 10
3.
  - (a) Explain the following terms related to thermocouples:—
    - (i) Law of intermediate metals.
    - (ii) Law of intermediate temperature.10
  - (b) Draw and explain the block diagram of DSO. 10
4.
  - (a) Draw and explain the following bridges:—
    - (i) Maxwell bridge
    - (ii) Schering bridge.10
  - (b) What are the types of errors in measurement system? Explain all in detail. 10
5.
  - (a) How the Lissajous figure are used for measurement of frequency and phase of the signal using CRO? Explain in detail. 10
  - (b) Draw and explain the construction and working of electronic voltmeter using transistors. 10
6. Write short notes on:— 20
  - (i) Ultrasonic type level transducers.
  - (ii) Displacement measurement using potentiometers.
  - (iii) Data acquisition system.
  - (iv) Specification of CRO.