23242

3 Hours / 70 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions :   (1)   All Questions are *compulsory.*

(2)   Illustrate your answers with neat sketches wherever necessary.

(3)   Figures to the right indicate full marks.

(4)   Assume suitable data, if necessary.

Marks

1.   Attempt any FIVE of the following :   **10**

(a)   State classification of systematic errors and define parallax error.

(b)   State any two applications of Ohm meter.

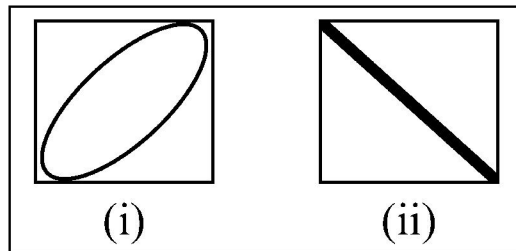(c)   Write phase shift between two frequency for given Lissajous pattern.

Fig. No. 1

(d)   Define Piezoelectric effect.

(e)   Draw the block diagram of instrumentation system.

(f)   State the meaning of PT-100.

(g)   State the need of signal conditioning.
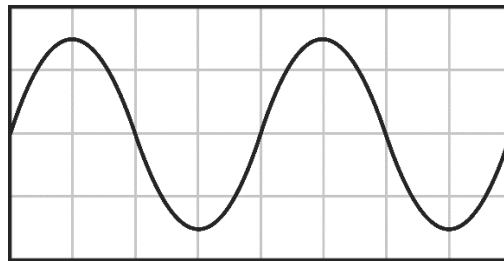
2. **Attempt any THREE of the following :** 12

   (a) Define standard and state the types of standards of measurement, explain any one.

   (b) Sketch constructional diagram of PMMC instrument and explain its working.

   (c) Draw the block diagram of CRO. State function of Delay line.

   (d) Draw the constructional diagram of variable flow meter and state advantages of it (any two).

3. **Attempt any THREE of the following :** 12

   (a) Sketch constructional details of moving iron attraction type instrument and explain its working.

   (b) Draw the block diagram of DSD and state digitizer.

   (c) State selection criteria of transducer.

   (d) Draw the block diagram of D.C. signal conditioning.

4. **Attempt any THREE of the following :** 12

   (a) Draw the circuit diagram of multirange ammeter and multirange voltmeter.

   (b) Explain calibration of voltmeter with neat sketch.

   (c) For the waveform shown on CRO, if volt/div is set 2 volt find (i) Peak to Peak voltage (ii) Amplitude (iii) R.M.S. voltage.

   Fig. No. 2

(d) Draw and explain the principle of electromagnetic flow meter.

(e) Draw and explain each block of multi-channel Data Acquisition System (DAS).

5. Attempt any TWO of the following : 12

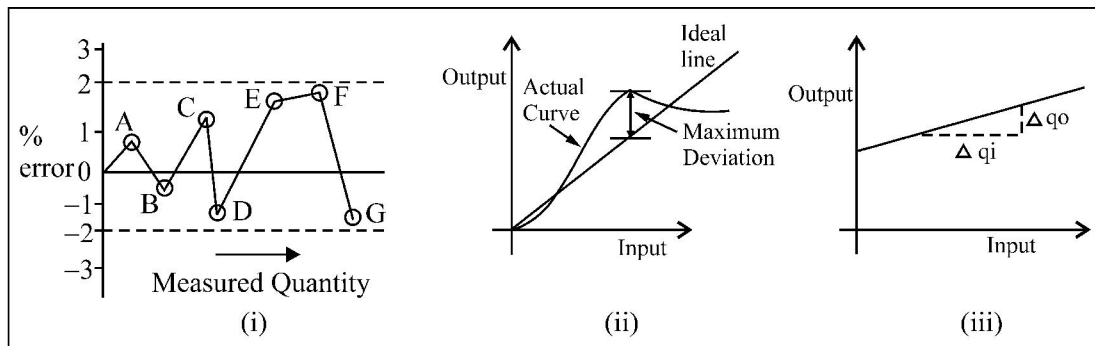(a) Define static characteristics and explain any 4 characteristics.

Fig. No. 3

(b) (i) Explain seeback effect with diagram. **2**

(ii) Draw neat sketch of optical pyrometer and state its 2 applications. **4**

(c) Analyze the missing block and explain it in following, also suggest name for given block diagram.
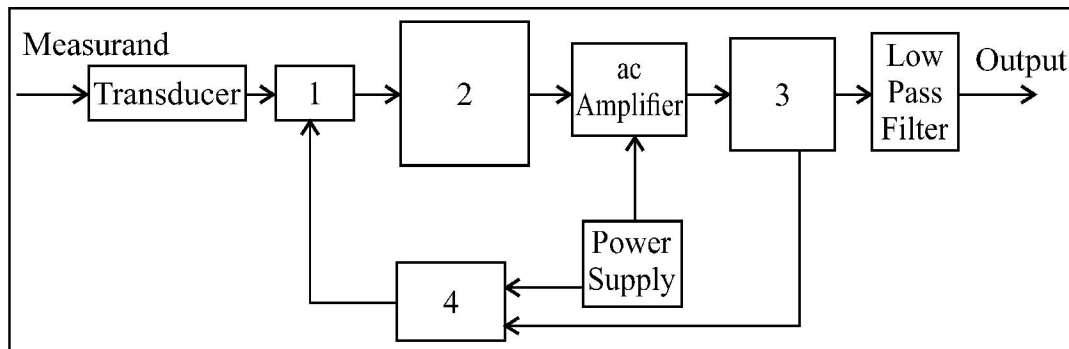

Fig. No. 4

6. **Attempt any TWO of the following :** 12

   (a) In an experiment the voltage across 5 KΩ resistor is applied to CRO. The screen shows a sinusoidal signal of total vertical 4 cm and horizontal 2 cm occupancy. Front panel controls set 5 v/div and 5 ms/div. Calculate :

   (i) Peak to peak voltage

   (ii) R.M.S. voltage

   (iii) Current

   (iv) Frequency

   (b) (i) Define Transducer. **2**

   (ii) Explain working principle of LVDT with neat sketch.

   (c) List the methods of level measurement explain any one.

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