# 17435

**11920**

**3 Hours / 100 Marks** Seat No. | | | | | | | | |

*Instructions* – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

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

(4) Figures to the right indicate full marks.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1.** a) **Attempt any SIX of the following:** **12**

(i) List any two piezoelectric materials.

(ii) Define absolute and secondary instruments.

(iii) State the difference between single beam dual trace CRO and dual beam dual trace CRO.

(iv) Draw circuit diagram of multi-range analog AC voltmeter.

(v) State any four applications of CRO.

(vi) List application of spectrum analyser.

(vii) Draw diagram of RVDT and label it.

(viii) State piezoelectric effect.

**Marks**

b) **Attempt any TWO of the following:** **8**

(i) With neat diagram explain working principle of capacitive transducer.

(ii) Define error. List the sources of error in measurement systems.

(iii) Draw a labelled diagram of PMMC instrument and state its working principle.

**2. Attempt any FOUR of the following:** **16**

a) Draw neat block diagram of DSO. List any two applications.

b) Write working principle of RTD with constructional diagram.

c) Draw labelled diagram of electromagnetic flowmeter and write its two advantages.

d) A 1mA meter movement with an internal resistance of 100 ohm is to be converted into a 0-100 mA ammeter. Calculate the value of shunt resistance required.

e) Write any four specifications of function generator.

f) Draw block diagram of digital frequency meter and write function of each block.

**3. Attempt any FOUR of the following:** **16**

a) Draw labelled diagram and waveforms for full wave rectifier type analog AC voltmeter.

b) Draw neat diagram of pulse generator.

c) Compare analog and digital multimeter. (Any four points).

d) Give the procedure to measure frequency and voltage using CRO in normal mode.

e) Write working principle of themocouple with neat diagram.

f) Draw block diagram of single beam dual trace CRO.

**Marks**

**4. Attempt any FOUR of the following:** **16**

a) State need of signal generator. Compare AF and RF type of signal generator.

b) Draw neat block diagram of wave analyzer and state function of each block.

c) Write working of CRT with neat diagram.

d) Draw block diagram of function generator.

e) Write working of LVDT with neat diagram.

f) Draw block diagram of instrumentation system and write function of each block.

**5. Attempt any FOUR of the following:** **16**

a) Give classification of thermocouple based on temperature range and material used.

b) Define waveform analyzer and write its need.

c) State with neat sketch operation of basic signal generator.

d) Write working of time difference type of ultrasonic flowmeter with diagram.

e) Compare active and passive transducer.

f) Give comparison between 2/314 wire RTD.

**Marks**

**6. Attempt any FOUR of the following:** **16**

a) Draw block diagram of LCR Q meter and explain it's operation.

b) Write any four applications of DMM.

c) Write function of delay line in CRO.

d) Define :

(i) Speed of response

(ii) Lag

(iii) Fidelity

(iv) Dynamic error

e) Calculate the values for multiplier for internal resistance 100 Ω of meter, full scale deflection current 50 mA. and voltage range are 0-10V, 0-100V and 0-200V.

f) Define the following terms

(i) Accuracy

(ii) Sensitivity

(iii) Resolution

(iv) Linearity