

22331

11819

3 Hours / 70 Marks

Seat No.

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- 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.
 - (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.
 - (7) Preferably, write the answer in sequential order.

Marks

1. Attempt any FIVE of the following :

10

- (a) Define the term "Accuracy".
- (b) Write features of PMMC instrument.
- (c) State applications of logic analyser.
- (d) Sketch the block diagram of signal generator.
- (e) List applications of CRO.
- (f) Define the term null as it applies to bridge measurement.
- (g) State specifications of digital instruments.

2. Attempt any THREE of the following :

12

- (a) Describe the different types of errors occurs in measurement.
- (b) Explain the role of series resistance connected in PMMC movement.
- (c) Sketch and describe block diagram of digital frequency meter.
- (d) Describe the operation of Wheatstone bridge.

3. Attempt any THREE of the following : 12

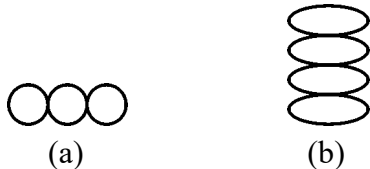
- Sketch and describe operation of half wave rectifier type AC Voltmeter.
- Explain with sketch operation of ramp type DVM.
- Explain with sketch time period measurement by CRO.
- Sketch and describe operation of DSO with block diagram.

4. Attempt any THREE of the following : 12

- Convert PMMC movement into DC ammeter of the range 0 to 50 mA.
- Sketch and label equivalent circuit diagram of practical ammeter and voltmeter.
- Sketch and explain block diagram of logic analyser.
- Determine value of R_x in Wheatstone bridge if
 $R_1 = 400 \Omega$, $R_2 = 5 \text{ K}\Omega$, $R_3 = 2 \text{ K}\Omega$
- Compare Dual slope DVM and SAR type DVM. (4 points)

5. Attempt any TWO of the following : 12

- State the need of calibration and explain the procedure to calibrate the instrument.
- Using Schering bridge, describe the procedure to measure the unknown value of capacitance.
- Calculate the frequency of vertical input for on oscilloscope which displays the following Lissajous figures. (Horizontal input frequency is 10 KHz)



6. Attempt any TWO of the following : 12

- The lowest range on a $4\frac{1}{2}$ digit DVM is 10 V. full scale. What is the sensitivity of this meter ?
- Describe the procedure how phase is measured by Lissajous pattern on CRO.
- A dc voltmeter uses $50 \mu\text{A}$ and having an internal resistance of 400Ω . Calculate the value of multiplier on ranges :
 (i) 10 V (ii) 15 V (iii) 20 V
