22331

22223

3 Hours / 70 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) Assume suitable data, if necessary.

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

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

Marks

1.   Attempt any <u>FIVE</u> of the following: **10**

a) Define the term calibration.

b) List silent features of PMMC.

c) Define resolution.

d) Give function of delay line in CRO.

e) List the measurements done with the help of CRO. (any four)

f) List types of

i)   AC

ii)   DC bridges

g) State different types of standard.

Marks

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

a) Give significance of calibration and tech steps carried out for calibration.

b) State the role of series resistance connected in PMMC movement.

c) Compare analog meter and digital meter. (any four points)

d) Describe with sketch the procedure to measure given unknown inductance value using relevant type of bridge.

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

a) With neat sketches give working of given type of ohm-meter.

b) Draw and explain each block of digital voltmeter.

c) With neat sketch explain frequency measurement by CRO.

d) Explain static and dynamic characteristics of instruments.

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

a) Convert PMMC movement into DC ammeter of the range 0 to 50 mA.

b) Describe the following terms of voltmeter

i) Loading effect

ii) Sensitivity

c) Identify the parameter measured by the give instruments.

i) LUX meter

ii) LCR meter

iii) DFM

iv) DVM

Also list 2 specifications of each meter.

d) Determine value of R_x in Wheston's bridge if $R_1 = 400\,\Omega$, $R_2 = 4\,K\Omega$, $R_3 = 2\,K\Omega$.

e) Draw labelled diagram of function generator.

Marks

5. Attempt any <u>TWO</u> of the following: **12**

a) Explain types of errors occurs in instrument.

b) Using schering bridge, describe the procedure to measure the unknown value of capacitance.

c) Compare dual slope DVM and SAR type DVM. (four points)

6. Attempt any <u>TWO</u> of the following: **12**

a) Calculate the value of multiplier resistance on the 50 V range of a DC voltmeter that uses a $200\,\mu A$ meter movement with an internal resistance of $100\,\Omega$.

b) With sketches give procedure how phase is measured by Lissajous pattern on CRO.

c) A DC voltmeter use $50\,\mu A$ and having an internal resistance of $400\,\Omega$. Calculate the value of multiplier on ranges.

   i)   10 V

   ii)   25 V

   iii) 20 V

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