BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Tech.(ECE)-2019/B.Tech.(ECE)-2020
Course Name – Electronic Instrumentation and Measurement
Course Code - OEC601A
(Semester VI)

Full Marks : 60   **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question)   1 x 15=15

1. *Choose the correct alternative from the following :*

(i) A moving-coil permanent-magnet instrument can be select as ………….. by using a low resistance shunt.

a) ammeter   b) voltmeter
c) flux-meter   d) ballistic galvanometer

(ii) For measurements on high voltage capacitors, the suitable bridge can apply

a) Wein bridge   b) Modified De Santy's bridge
c) Schering bridge   d) none of the above

(iii) Write, In electrical measuring instruments electrical energy is converted to

a) Mechanical energy   b) Heat energy
c) Chemical energy   d) Light energy

(iv) Bar express as the unit of

a) Temperature   b) Heat
c) Atmospheric pressure   d) Current

(v) Calculate error of measurement =

a) True value – Measured value   b) Precision – True value
c) Measured value – Precision   d) None of the above

(vi) Error due to eye vision observe is termed as

a) climax error   b) sight error
c) parallax error   d) visional error

(vii) Noise establish as a function of _____

a) voltage   b) current
c) bandwidth   d) frequency

(viii) In a Wheatstone bridge method, the bridge is said to be balanced, when the current indicate

a) 1 A   b) 0 A
c) Maximum   d) Half of the maximum value

(ix) In function generator, the output waveform of integrator express_____ wave

    a) Sinusoidal   b) Square

    c) Triangular   d) Saw-tooth

(x) Q meter choose to measure the properties of

    a) Inductive coils   b) Non inductive coils

    c) Capacitive coils   d) Both (a) and (c)

(xi) Write, With the increase in the intensity of light, the resistance of a photovoltaic cell

    a) Increases   b) Decreases

    c) Remains same   d) None of these

(xii) The Wien's bridge is select, for the measurement of frequency of the range of

    a) Less than 100 Hz   b) 100 Hz to 100 kHz

    c) 1 kHz to 100 MHz   d) More than 100 MHz

(xiii) Select the bridge, suitable for the measurement of capacitance is

    a) Anderson's bridge   b) Hay's bridge

    c) Owen's bridge   d) None of These

(xiv) Under balanced condition, select the current flowing through the detector is equal to

    a) 1 A   b) 0 A

    c) Sum of the currents flowing in the   d) Difference between the current flowing in the

(xv) State, Oscilloscope is _____

    a) a ohmmeter   b) an ammeter

    c) a voltmeter   d) a multimeter

Group-B
(Short Answer Type Questions)   3 x 5=15

2. List the three forces involved in the moving systems of a deflection instrument.   (3)
3. Compare a true RMS voltmeter with an AC voltmeter.   (3)
4. How is an electron beam focus onto a fine spot on the face of the CRT?   (3)
5. Tell the function of aquadag.   (3)
6. Write the importance of bridge?   (3)

OR

   Write the significance of sensitivity in voltmeters?   (3)

Group-C
(Long Answer Type Questions)   5 x 6=30

7. Draw the basic block diagram of an oscilloscope and state the functions of each block. (5)
8. Explain with diagram the operation of Wheatstone bridge. (5)
9. A PMMC instrument has a coil of dimensions 20mm X 15mm. The flux density in the air gap is 1.8 X 10-3 wb/m2 and the spring constant is 0.15 X 10^-6 Nm/V. Calculate the number of turns required to produce an angular deflection of 1800. When current of 2 mA flowing through the coil. (5)
10. Explain the terms a) Static Error b) Static Correction c) Relative Error d) Percentage Relative Error. (5)
11. The focusing system in a CRT is known as electron lens, Justify. (5)
12. The arms of an ac Maxwell's bridge are arranged as follows: AB and BC are non-reactive resistors of 100 Ω each, DA a standard variable reactor L1 of resistance 32.7 Ω and CD consists of a standard variable resistor R in series with a coil of unknown impedance Z, balance was found with L1=50 mH and Z=1.36R.Express the R and L of coil. (5)

OR

   A Maxwell bridge is used to measure inductive impedance. The bridge constants at balance are C1=0.01 µF, R1=470 KΩ, R2=5.1 KΩ and R3=100 KΩ. Express the series equivalent of (5)

the unknown impedance.

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