BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – Dip.EE-2022
Course Name – Electrical Measuring Instrument
Course Code - DEEPC402
(Semester IV)

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) Measurement of a quantity defined as

a) an act of comparison of an unknown quantity with a predefined acceptable standard which is accurately known
b) an act of comparison of an unknown quantity with another quantity
c) an act of comparison of an unknown quantity with a known quantity whose accuracy may be known or may not be known
d) none of these

(ii) State the smallest change in a measured variable to which an instrument will respond is

a) resolution
b) precision
c) sensitivity
d) accuracy

(iii) Identify the minimum number of data points needed to calculate the standard deviation.

a) 1
b) 2
c) 3
d) 4

(iv) Name the current is commonly used in household circuits

a) DC current
b) AC current
c) Pulsating current
d) Square wave current

(v) Choose the instrument is used to measure the phase difference between two AC voltages or currents

a) Phase meter
b) Phase shifter
c) Oscilloscope
d) Spectrum analyzer

(vi) Select the purpose of a potentiometer in an electrical circuit.

a) To measure the voltage of the circuit
b) To regulate the current in the circuit
c) To change the resistance of the circuit
d) To change the current

(vii) Select the purpose of a transceiver.

a) To transmit and receive signals
b) To amplify signals
c) To filter signals
d) To store signals

(viii) Select advantage of power factor correction

a) Lower current and voltage
b) Higher current and voltage
c) Lower power consumption
d) Higher power consumption

(ix) Identify which is not a source of error in power measurement

a) Instrumental errors
b) Human errors
c) Environmental errors
d) Power factor errors

(x) Identify in a Schering bridge, the ratio of the capacitance in the two arms is known as

a) Balance ratio
b) Schering ratio
c) Resistance ratio
d) Impedance ratio

(xi) Identify the minimum distance between electrodes for earth resistance measurement.

a) 1 meter
b) 2 meters
c) 3 meters
d) 4 meters

(xii) If a machine does 100 joules of work in 10 seconds, select output power in watts

a) 10 W
b) 100 W
c) 1000 W
d) 10,000 W

(xiii) Identify the right formula for inductance.

a) L=emf*t/I
b) L=emf/t*I
c) L=emf*I/t
d) L=emf*t*I

(xiv) If the current changes from 3A to 5A in 2s and the emf is 10V. Calculate the inductance.

a) 10H
b) 20H
c) 30H
d) 40H

(xv) Identify the effect of the inductance when the current in the coil becomes double its original value.

a) Becomes half
b) Becomes four times
c) Becomes double
d) Remains same

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Draw the connection diagram of energy meter. (3)
3. Describe the advantages and disadvantages of 3phase power measurement by 2 wattmeter method. (3)
4. Explain the working of Dynamometer type instruments. (3)
5. Discuss the advantages and disadvantages of Maxwell's bridge for measurement of unknown inductance. (3)
6. A 1 mA meter d'Arsonval movement with an internal resistance of 100 ohm is to be converted into a 0-100 mA ammeter. Calculate the shunt resistance required. (3)

OR

Calculate the multiplying power of a shunt of 200 ohm resistance use with a galvanometer of 1000 ohm resistance. Determine the value of shunt resistance to give a multiplying power of 50. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain how current transformer is used in current measurement? (5)
8. State and analyze the features of a digital multimeter. (5)
9. Deduce the formula of Maxwell's inductance bridge. (5)
10. Describe the construction of Earth tester. (5)
11. Define accuracy, precision, resolution with example. (5)

12. Two wattmeters connected to measure the input to a balance three phase circuit indicate 2000watt and 500watt respectively . Calculate the power factor of the circuit . (5)

OR

Compare and contrast between PMMC and MI instruments. (5)

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