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Question Paper Code: 43604

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Third Semester

Instrumentation and Control Engineering

14UIC304 - MEASUREMENTS AND INSTRUMENTATION

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 1 = 10 Marks)

1. A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly
(a) deflecting (b) controlling (c) damping (d) none of these
2. A ballistic galvanometer is used for the measurement of
(a) Voltage (b) Current (c) Frequency (d) Electrical charge
3. The power measurement in a balanced 3-phase circuit can be done by
(a) One wattmeter method (b) Two wattmeter method
(c) Three wattmeter method (d) None of the above
4. In a 3-phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be
(a) unity (b) 0.5 (c) 0.3 (d) zero
5. Potentiometer is an _____ instrument
(a) Indicating (b) Comparison (c) Calibrating (d) Recording

6. Which of the following devices should be used for the accurate measurement of low D.C. voltage?
- (a) Small range moving coil voltmeter (b) D.C. potentiometer
(c) Small range thermocouple voltmeter (d) None of these
7. From the point of view of safety, the resistance of earthing electrode should be
- (a) low
(b) high
(c) medium
(d) the value of resistance of earth electrodes does not affect the safety
8. For measuring a very high resistance we should use
- (a) Kelvin's double bridge (b) Wheat stone bridge
(c) Meggar (d) None of the above
9. Anderson's bridge is a modification of
- (a) Maxwell's wien bridge (b) Hay's bridge
(c) Schering bridge (d) Owen bridge
10. For measurements on high voltage capacitors, the suitable bridge is
- (a) Wein bridge (b) Modified De Santy's bridge
(c) Schering bridge (d) none of these

PART - B (5 x 2 = 10 Marks)

11. Compare Moving coil with Moving iron instruments.
12. Define Creeping in energy meter.
13. How the phase angle is measured in polar type potentiometers.
14. State the condition for balance in a Wheatstone bridge.
15. Define Q-factor of the coil

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail about the principle, construction and working of D'Arsonval galvanometer with a neat diagram. (16)

Or

- (b) Explain in detail about the principle, construction and operation of moving coil instrument with neat sketches. (16)
17. (a) Describe the construction details of an electro-dynamometer type wattmeter with a neat diagram. (16)

Or

- (b) Explain the construction and working principle of single phase energy meter with neat diagram. (16)
18. (a) With neat circuit diagram explain the principle and operation of Crompton's type and polar type potentiometers. (16)

Or

- (b) Explain the principle of operation of Drysdale phase shifting transformer. How it is used in polar type A.C potentiometer to measure the unknown e.m.f? (16)
19. (a) (i) Derive an expression for finding out the unknown low resistance under balanced condition. (10)
- (ii) Explain the working of shunt type ohmmeter. (6)

Or

- (b) Explain the following methods of high resistance measurement:
- (i) Direct deflection method (8)
- (ii) Loss of charge method (8)
20. (a) Discuss the operation of Schering bridge to determine unknown capacitance. Derive the relevant equations and explain the computation procedure using phasor diagram. (16)

Or

- (b) (i) With neat diagram describe in detail about the Maxwell bridge in measurement system. (10)
- (ii) Explain the various types errors in DC Bridge methods. (6)

