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Question Paper Code: 43604

B.E. / B.Tech. DEGREE EXAMINATION, NOV 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)

- The moving iron voltmeters are likely
 - To indicate the same value of the ac as on dc
 - To indicate higher value of ac than on dc
 - To indicate lower value of ac than on dc
 - The moving iron instruments should not be used for dc measurements
- If a voltmeter is connected, like an ammeter in series to the load
 - The measurement reading will be too high
 - Almost no current will flow in the circuit
 - The meter will burn
 - An instantaneously high current will flow
- The power measurement in a balanced 3-phase circuit can be done by
 - One wattmeter method
 - Two wattmeter method
 - Three wattmeter method
 - None of the above
- 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
 - unity
 - 0.5
 - 0.3
 - zero

5. The standardization of potentiometers is done in order that, they become
- (a) accurate
 - (b) precise
 - (c) accurate and direct reading
 - (d) accurate and precise
6. The nominal ratio of a current transformer is
- (a) primary winding current x secondary winding current
 - (b) rated primary winding current/ rated secondary winding current
 - (c) number of secondary winding turns/ primary winding turns
 - (d) primary winding voltage/ secondary winding voltage
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 Phantom loading.
13. Mention the errors in instrument transformer.
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) (i) Describe in detail about the calibration of voltmeter and ammeter. (10)
(ii) Explain the various types of errors in detail for the voltmeter and ammeter. (6)

Or

- (b) Explain in detail about the principle, construction and operation of moving coil instrument with neat sketches. (16)
17. (a) (i) With a neat diagram, explain the construction, working principle of single phase wattmeter. Also write the importance of deflection torque in these instruments. (12)
(ii) Explain the special features incorporated in electrodynamic type wattmeter to make it as low power factor meters. (4)

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) (i) With neat sketch, describe the principle of operation of current transformer. (10)
(ii) Discuss the use of current transformer for current and power measurement. (6)
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) (i) Explain the construction and working principle of Megger. (12)
(ii) When are contact and head resistance are important? (4)

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) With neat diagram describe in detail about the Maxwell bridge in measurement system. (16)
