**Reg. No. :** | | | | | | | | | | |

## Question Paper Code: 41634

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

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. If a voltmeter is connected, like an ammeter in series to the load

   (a) The measurement reading will be too high
   (b) Almost no current will flow in the circuit
   (c) The meter will burn
   (d) An instantaneously high current will flow

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 these

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. A phase shifting transformer is used in conjunction with

(a) D.C. potentiometer (b) Drysdale potentiometer
(c) A.C. co-ordinate potentiometer (d) Crompton potentiometer

7. Megger is an instrument used for the measurement of
(a) High resistance and insulation resistance (b) Medium resistance
(c) Low resistance (d) Leakage current

8. 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

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. How resistance is measured in loss of charge method.

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) Describe the construction details of an electrodynamometer type wattmeter with a neat diagram. (16)

Or

(b) Describe the construction and working principle of single phase induction type energy meter. Write a short note on any two adjustments required in energy meters. (16)

18. (a) 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)

Or

(b) Explain with neat sketch the classification of instrument transformers. Write a note on the errors affecting the characteristics of an instrument transformer. (16)

19. (a) Obtain the expression for the measurement of resistance using Wheatstone bridge and Kelvin double bridge. (16)

Or

(b) (i) Explain the construction and working principle of Megger. (12)

(ii) When are contact and head resistance are important? (4)

20. (a) Explain the working principle of Schering Bridge and also derive its balance equations. (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 AC Bridge methods. (6)

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