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

Question Paper Code: 43604

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

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 the above

2. A moving coil permanent magnet instrument can be used as flux meter

   (a) by using a low resistance shunt
   (b) by using a high series resistance
   (c) by eliminating the control springs
   (d) by making control springs of large moment of inertia

3. A dynamometer wattmeter can be used for

   (a) Both D.C. and A.C (b) D.C. only
   (c) A.C. only (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. Instrument transformers are

(a) potential transformers (b) current transformers
(c) both (a) and (b) (d) power transformers

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. Maxwell's inductance-capacitance bridge is used for measurement of inductance of

(a) low Q coils (b) medium Q coils
(c) high Q coils (d) low and medium Q coils

10. The bridge used for the precise measurement of inductances over a wide range is

(a) Maxwell bridge (b) Wein's bridge
(c) Anderson bridge (d) Hay's bridge

PART - B (5 x 2 = 10 Marks)

11. State two sources of error in MI instrument.

12. Define Phantom loading.

13. How the phase angle is measured in polar type potentiometers.

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) 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) Explain the construction and operation of Electrodynamometer type wattmeter in detail with neat diagram. (16)

Or

(b) Explain the construction and working principle of single phase energy meter with neat diagram. (16)

18. (a) (i) Explain in detail about the laboratory type DC potentiometer. (10)

(ii) Compare DC potentiometer and AC potentiometers. (6)

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) (i) How the unknown frequency is measured using Wein bridge method? (8)

(ii) Obtain the expression of capacitance using Schering bridge with neat diagram? (8)

Or

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

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