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Question Paper Code: 50346

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Electrical and Electronics Engineering

15UEE406 - ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A set of reading has a wide range and therefore it has
 - (a) Low precision
 - (b) High precision
 - (c) Low accuracy
 - (d) High accuracy
2. Dynamic response consists of
 - (a) Two parts, one steady state and the other transient state response
 - (b) Only transient state response
 - (c) Only steady state response
 - (d) Steady state and transient frequency response
3. A 1 mA ammeter has a resistance of 100Ω . It is to be converted to a 1A ammeter. The value of shunt resistance is
 - (a) $0.001\ \Omega$
 - (b) $0.1001\ \Omega$
 - (c) $100000\ \Omega$
 - (d) $100\ \Omega$
4. A capacitor is connected across a portion of resistance of the multiplier in order to make the pressure coil circuit non-inductive. The value of this resistance is r while the total resistance and inductance of pressure circuit are respectively R_p and L . The value of capacitance C is
 - (a) $0.41L/r^2$
 - (b) $0.41L/R_p^2$
 - (c) L/R_p^2
 - (d) L/r^2
5. The standardization of AC potentiometers is done by
 - (a) Directly using AC standard voltage source
 - (b) Using DC standard source and transfer instruments

- (c) Using DC standard source and d'Arsonval galvanometer
(d) Using AC standard source and transfer instruments
6. 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
7. In a CRT the following anode is located
- (a) Between pre-accelerating anodes (b) After accelerating anode
(c) Before pre-accelerating anode (d) None of these
8. X-Y recorders
- (a) Record one quantity with respect to another quantity
(b) Record one quantity on X-axis with respect to time on Y-axis
(c) Record one quantity on Y-axis with respect to time on X-axis
(d) Record two quantities
9. Dummy strain gauges are used for
- (a) Compensation of temperature changes
(b) Increasing the sensitivity of bridge in which they are included
(c) Compensating for different expansion
(d) Calibration of strain gauges
10. One of the following is an active transducer
- (a) Strain gauge (b) Selsyn
(c) Photovoltaic cell (d) Photo-emissive cell

PART - B (5 x 2 = 10 Marks)

11. What is fidelity in instruments?
12. List out various types of analog instruments.
13. What is electro magnetic interference?
14. What is dot matrix display?
15. Define hall effect.

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Explain with block diagram functional elements of an instrument. (8)
(ii) Summarize various types of errors and their elimination in instruments. (8)

Or

- (b) (i) Describe the following static characteristics of an instruments (i) Accuracy
(ii) Reproducibility (iii) Static error (iv) Drift. (8)
- (ii) Discuss various type of standards. (8)
17. (a) (i) Explain principle of operation of permanent magnet moving coil instruments. (8)
- (ii) Discuss working of maximum demand indicator. (8)

Or

- (b) (i) With neat diagram explain principle of operation of single phase energy meter. (8)
- (ii) Summarize how to obtain B-H curve of a ring specimen. (8)
18. (a) With diagram explain working of duo-range D.C. potentiometer. (16)

Or

- (b) Obtain expression for unknown inductance using Anderson's bridge with its circuits and phasor diagram. (16)
19. (a) (i) With diagram explain the operation CRT display. (8)
- (ii) Explain working of magnetic tape recorder with neat diagram. (8)

Or

- (b) (i) Explain the working of XY- recorder in detail. (8)
- (ii) With block diagram discuss about storage CRO. (8)
20. (a) (i) Explain in detail about inductive transducer. (8)
- (ii) Discuss working of Piezo electric transducer. (8)

Or

- (b) (i) Discuss about working of LVDT in detail. (8)
- (ii) Summarize the various elements of data acquisition system in detail. (8)

