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Question Paper Code: 44305

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

Fourth Semester

Electrical and Electronics Engineering

14UEE405 - ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The span of a zero-centered voltmeter having a scale from -10 V to $+10\text{ V}$ is _____
(a) 0 V (b) -10 V (c) 10 V (d) 20 V
2. The ratio of maximum displacement deviation to the full scale deviation of the instrument is called
(a) Static sensitivity (b) Accuracy (c) Linearity (d) Precision
3. PMMC instrument gives uniform scale because
(a) It uses spring control
(b) It uses eddy current damping
(c) The deflection torque is proportional to the instrument current
(d) Both (a) and (c)
4. The damping torque must operate only when the moving system of the indicating instrument is
(a) Actually moving (b) Stationary
(c) Just starting to move (d) Near its full deflection

5. Maxwell-Wien bridge is used to measure
- (a) Inductance (b) Capacitance
(c) Dielectric loss (d) Frequency
6. Kelvin double bridge is best suited for the measurement of
- (a) Inductance (b) Capacitance
(c) Low resistance (d) High resistance
7. Which part is called as heart of CRO?
- (a) CRT (b) Sweep generator
(c) Trigger circuit (d) Amplifier
8. In CRO the time base signal is applied to
- (a) Y-plates (b) X-plates
(c) Either X-plate or Y-plate (d) Both X-plate and Y-plate
9. The linear variable differential transformer transducer is
- (a) Inductive transducer (b) Non-inductive transducer
(c) Capacitive transducer (d) Resistive transducer
10. What is a reading of 0.5245 on 1 V range in four and a half digit voltmeter displayed as
- (a) 0.5245 (b) 00.524 (c) 000.52 (d) 0000.5

PART - B (5 x 2 = 10 Marks)

11. Define the term "Gross error".
12. Define creeping in energy meter. How it is prevented?
13. What is called a volt-ratio box?
14. List the components of a magnetic tape recorder.
15. Mention any four types of analog to digital converter.

PART - C (5 x 16 = 80 Marks)

16. (a) Draw the block diagram showing the basic functional elements of an instrument and explain the functions of each. (16)

Or

- (b) Discuss the different types of standard of measurement. (16)
17. (a) (i) Derive the construction and working of PMMC instrument and also derive its torque equation. (8)
- (ii) Write short note on any two adjustments required in energy meters. (8)

Or

- (b) Explain and Working principle of measurement of phase. (16)
18. (a) Describe the circuit of Kelvin double bridge used for measurement of low resistance. (16)

Or

- (b) Explain in details about the measurement of frequency by Wien Bridge. (16)
19. (a) Explain the construction and its working principle of X-Y Recorder. (16)

Or

- (b) Discuss in detail about dot matrix displays. (16)
20. (a) Explain the construction and working principle of Linear Variable Differential Transducer(LVDT). (16)

Or

- (b) (i) Explain in detail about the various elements of data acquisition system with necessary block diagram. (10)
- (ii) For a 5 bit ladder, if the input levels are $0 = 0\text{ V}$ and $1 = +10\text{ V}$. What are the output voltages for each bit? (6)
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