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

Question Paper Code: 44305

B.E. / B.Tech. DEGREE EXAMINATION, NOV 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 reliability of the instrument refer to

   (a) Measurement of changes due to temperature variations

   (b) Degree to which repeatability continues to remain within specified limits

   (c) The life of the instrument

   (d) The extent to which the characteristics remain linear

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 Sensitivity of a Multimeter which has full deflection current of 1 *mA* is

(a)100 Ω / *V* (b)1000 Ω/ *V* (c)10 Ω/ *V* (d) 1 Ω / *V*

5. The primary current in a CT is dictated by _____

(a) The secondary burden (b) The core of the transformer
(c) The load current (d) None of the above

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. Advantage of passive instrument is

(a) It does not need power supply (b) Cheap
(c) Sensitive (d) Accurate

PART - B (5 x 2 = 10 Marks)

11. Illustrate the difference between accuracy and precision.

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

(ii) The Expected value of the current through a resistor is 20 *mA*. However the measurement yields a current value of 18 *mA*. Calculate

(i) absolute error (ii) % error

(iii) relative accuracy (iv) % accuracy. (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) (i) With neat diagram explain the working principle of successive approximation type of digital voltmeter. (8)

(ii) Describe the construction and functioning of electrical resonance frequency meter. (8)

18. (a) Describe the circuit of Maxwell bridge used for measurement of capacitance (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) (i) Explain the working principle of CRT. (10)

(ii) Explain the digital storage oscilloscope with neat diagram. (6)

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) With neat diagram explain the construction and principles of dual slope ADC (6)