A   Reg. No. : ☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 93306

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2022

Third Semester

Electrical and Electronics Engineering

19UEE306 - ELECTRICAL MEASUREMENTS AND INSTRUMENTATION

(Regulation 2019)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The fact as to how closely the instrument reading follows the measured   CO1- R
   variables is called the

   (a) precision   (b) fidelity   (c) accuracy   (d) sensitivity

2. The difference between the upper and lower limit in instrument range is   CO1- R

   (a) Span   (b) Drift   (c) Range   (d) Sensitivity

3. The PMMC instruments is used for _____ measurement   CO2-R

   (a) DC   (b) AC   (c) DC & AC   (d) None

4. The instrument used for measurement of energy is called ___   CO2-R

   (a) Watt meter   (b) PMMC   (c) Energy meter   (d) Moving iron

5. A Potentio meter is basically a   CO3- R

   (a) Deflectional type instrument   (b) null type instrument

   (c) deflectional as well as null type instrument (d) digital instrument

6. The inductance of a high Q inductor can be measured using a   CO3- R

   (a) Schering bridge   (b) Wein bridge

   (c) Maxwell bridge   (d) Hay bridge

7. Magnetic tape is made up of _____ materials   CO4- R

   (a) magnetic iron oxide   (b) iron oxide

   (c) magnetic oxide   (d) None of the above

8. Digital X-Y plotters is also called as_____   CO5- R

    (a) Recorder   (b) Plotter

    (c) Digital Plotter   (d) Analog X-Y recorder

9. Which transducer does not require external power source for its operation.   CO5- R

    (a) Active transducer   (b) Passive transducer

    (c) Both a & b   (d) none

10. Thermocouple works on the principle _____   CO5- R

    (a) Piezo-electric effect   (b) Hall effect   (c) Seeback effect   (d) Watt/m

<div align="center">PART – B (5 x 2= 10 Marks)</div>

11. Examine the Accuracy of an instrument?   CO1-U

12. Classify the types of instruments used as ammeter and voltmeter.   CO2-U

13. Outline the circuit diagram of Maxwell bridge   CO3-U

14. Classify the different methods of magnetic tape recording.   CO4-U

15. Explain any 4 types of analog to digital convertor?   CO5-U

<div align="center">PART – C (5 x 16= 80Marks)</div>

16. (a) Explain the functional elements of measurement system with neat   CO1-U   (16)
        diagram

<div align="center">Or</div>

    (b) If the rms value of reading in volts are observed in a digital CRO,   CO1-U   (16)
        were **3.5, 3.452, 3.620, 3.523**
        Calculate (i) Arithmetic mean (ii) Deviation (iii) Average deviation
        (iv) Standard deviation

17. (a) Illustrate the construction and working of PMMC instruments.   CO2- U   (16)
        Derive the equation for deflection.

<div align="center">Or</div>

    (b) Explain the construction and working of moving iron instruments.   CO3- U   (16)
        Derive the equation for deflection

18. (a) Explain the circuit of Kelvin double bridge used for measurement   CO3- U   (16)
        of low resistance. Derive the condition for balance.

<div align="center">Or</div>

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(b) Illustrate the construction and working of laboratory type DC potentiometer with a neat sketch.   CO3- U   (16)

19. (a) Illustrate the working principle of digital storage oscilloscope to display the waveforms.   CO4- U   (16)

Or

(b) Bring out how data loggers measure and record data effortlessly, accurately and quickly explaining the working of them. What is data logger?   CO4- U   (16)

20. (a) Explain the construction and working of LVDT with a neat sketch   CO5- U   (16)

Or

(b) Explain the binary weighted resistor technique of D/A conversion.   CO5- U   (16)

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