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

Question Paper Code : 19EE4B

B.E / B.Tech DEGREE EXAMINATION, NOV / DEC 2021

Fifth Semester

EE19504 - MEASUREMENTS & INSTRUMENTATION

Electrical and Electronics Engineering

(Regulations 2019)

Time : Three Hours Maximum : 100 Marks

Answer ALL Questions

PART A (10 x 2 = 20 Marks)

1. Define Fidelity.
2. A Voltmeter reads 127.5 V and the true value of the voltage is 127.43V. Determine the static error and the relative error as a fraction of true value.
3. A PMMC Ammeter gives a full-scale deflection of 10mA, when the potential difference applied is 100 mV. Calculate Rsh for the full-scale deflection of 100 A.
4. Discuss in brief about the hysteresis in B-H Curve.
5. Compare digital voltmeters with Analog Voltmeters.
6. What is the significance of Spectrum Analyzer?
7. What is the function of Volt –Ratio box?
8. List any three features of Transformer Ratio Bridges.
9. Compare Transducer and Inverse Transducer with example.
10. Write the principle of Capacitive Transducer.

PART B (5 x 13 = 65 Marks)

11. a.(i). Distinguish Accuracy with Precision. (6)

(ii) Discuss the different types of standards in detail. (7)

(OR)

b. A circuit was tuned for resonance by eight different students and the values of resonant frequency in KHz were recorded as 532, 548, 543, 535, 546, 531, 543 and 536.Calculate arithmetic mean, mean deviation, standard deviation, probable error of one reading and probable error of mean.

12. a. Prove that PMMC Meter is the most appropriate instrument for measuring only the DC voltages and currents by deriving the suitable expression and also explain it construction and working.

(OR)

b. What are Instrument Transformers? How the power measurement is carried out using Instrument Transformers.?

13. a. Explain in detail about the construction and working of Electrical Resonance type Frequency Meter.

(OR)

b. Discuss in detail about the construction and working of Digital Storage Oscilloscope.

14. a. Draw the neat diagram of Kelvin's Double Bridge and explain how to measure the low resistance and also list its advantages.

(OR)

b. Explain in detail about Electromagnetic and Ground loop interference and the methods to mitigate them.

15. a. Explain in detail about any two applications of an inductive transducer.

(OR)

b. Explain in detail about the measurement of angular displacement using Digital Shaft Encoder.

PART C (1x15=15 Marks)

16. a. Derive an appropriate expression to determine the sensitivity factor of the Strain Gauge by applying Piezo Resistive Effect.

(OR)

b. A capacitor bushings forms ab – arm of Schering's bridge and a standard capacitor of 500 PF capacitance forms the arm ad. Arm bc consists of non - inductive resistance of 300 Ohms. When the bridge is balanced, the arm cd has a resistance of 72.6 Ohms in parallel with a capacitance of 0.148 µF. The supply frequency is 50 Hz. Calculate the capacitance and dielectric loss angle of the capacitor. Derive the equations for balance and draw the phasor diagram under balanced conditions.

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