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Question Paper Code:R3B05

B.E./B.Tech. DEGREE EXAMINATION, NOV 2025

Third Semester

R21UBM305- SENSORS AND MEASURING TECHNIQUES

Biomedical Engineering

(Regulations R2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Compare the static and dynamic characteristics of an instrument. CO1- U
2. Why calibration of instrument is important? CO1- U
3. Define Seeback effect and state the significance of them. CO1- U
4. Identify the types of errors in measurement CO2- App
5. Explain the concept of a photovoltaic cell and its basic functioning. CO1- U
6. Define Photo diode. CO1- U
7. List out the advantages of Maxwell bridge. CO1- App
8. Distinguish between Wheatstone bridge and Kelvin's bridge. CO1- Ana
9. What are the different types of digital display devices? CO1- U
10. Describe the different types of sweeps used in CRO. CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) The following values were obtained from the measurement of current: 15.35A, 17.71 A, 16.48 A, 10.24 A, 14.63 A and 18.58 A. Calculate: (a) error. CO2- App (16)
Or
(b) The following values were obtained from the measurement of current: 12.35A, 12.71 A, 12.48 A, 10.24 A, 12.63 A and 12.58 A. CO2- App (16)
Calculate: (a) The arithmetic mean (b) The average deviation
(c) The standard deviation (d) Variance.

12. (a) Explain the construction and Principle of Thermocouple. CO1- U (16)
Or
(b) Explain the construction, principle, working of thermistor and its resistance temperature characteristics. CO1- U (16)
13. (a) Briefly explain about the Photo Multiplier Tube with its diagram CO1- U (16)
Or
(b) Discuss the principle of operation of piezoelectric transducers. CO1- U (16)
What are the applications of this sensor.
14. (a) Analyze the functional operations of the following: CO3- Ana (16)
(i) Schering bridge,
(ii) Hay bridge.
Or
(b) Compare the wave analyzer and Spectrum analyzer with neat CO3-Ana (16)
diagram.
15. (a) Outline the operation of: (i) Light emitting diode.(ii) Liquid CO1- U (16)
crystal display.
Or
(b) Interpret on the following with relevant details: CO1- U (16)
(i) Digital Recorder
(ii) Graphical Recorder