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Question Paper Code: 93B06

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

Third Semester

Biomedical Engineering

19UBM306 - SENSORS AND MEASURING TECHNIQUES

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. List different test inputs CO1 U
2. Define Static Error CO1 U
3. Define strain CO2 U
4. What are the 2 types of temperature coefficients CO2 U
5. Photo multiplier –state the naming reason CO3 U
6. Define Dark Resistance of Photo transducer CO3 U
7. List the basic components of measuring Bridge circuit CO4 U
8. What is impedance, can we measure impedance using DC Bridge? CO4 U
9. List the characteristics of probes used in CRO CO5 U
10. What are the advantages of DVM CO5 U

PART – B (5 x 16= 80Marks)

11. (a) (i) With necessary diagram explain the basic functional blocks of a measuring system CO1- U (8)
(ii) List the various types of Instruments CO1- U (8)

Or

(b) Discuss about the types of errors in measurement system and explain how they are corrected CO1- U (16)
12. (a) (i) Explain in detail different types of Strain gauge with neat diagram CO2- U (8)
(ii) With necessary diagram explain the principle and working of thermocouple CO2- U (8)

Or

- (b) (i) Derive the equation for gauge factor CO2- App (8)
(ii) Explain how LVDT is used for measuring displacement and direction with neat diagrams CO2- U (8)
13. (a) (i) With necessary diagrams Explain the following transducers CO3- U (8)
(i) Phototube
(ii) Photo multiplier
(iii) Photovoltaic Cell
(ii) What is scintillation counter, how it is used as a transducer for measurement CO3- U (8)
- Or
- (b) (i) With neat diagram explain Ultrasound transducer CO3- U (8)
(ii) Write short notes on Nano sensors CO3- U (8)
14. (a) (i) Which bridge is used for measuring frequency, Explain CO4- Ana (8)
(ii) With neat diagram derive the balancing equation of Wheatstone Bridge and also discuss its limitations CO4- App (8)
- Or
- (b) Explain two different types of Schering Bridge for Inductance measurements and Derive their balancing equations CO4- U (16)
15. (a) Explain Digital Multimeter working and its applications CO5- U (16)
- Or
- (b) (i) With necessary diagrams explain the vertical and horizontal deflection system of a CRO CO5- U (8)
(ii) Write short notes on Magnetic Tape Recorders CO5- U (8)