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Question Paper Code: 51129

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Second Semester

Biomedical Engineering

15UBM209 - SENSORS AND MEASUREMENT TECHNIQUES

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- The ability to give same output reading when same input value is applied repeatedly is known as
 - Stability
 - Repeatability
 - Accuracy
 - Sensitivity Stability Accuracy
- The following is not a static performance parameter to be looked into before selecting a parameter
 - Range
 - Deflection
 - Stability
 - Error
- Temperature coefficient of Thermistor is
 - Negative
 - Positive
 - Zero
 - Infinity
- Pressure transducer for measuring blood pressure is
 - Strain gauge transducer only
 - Strain gauge or capacitive transducer
 - Resistive transducer
 - Fiber optic transducer
- Hall Effect sensors are used in
 - Flow meter
 - Fuel level indicator
 - Both (a) and (b)
 - Temperature sensor

6. _____ fiber is used inter ferometric instruments.
- (a) mono mode (b) multimode
(c) birefringent (d) coated
7. In strip chart recorders, the self balancing potentiometers plot emf as a function of
- (a) Another emf (b) Frequency
(c) Time (d) Pressure
8. In phase response of a recorder noise level _____ with the bandwidth of the system.
- (a) Increases (b) Decreases
(c) Reaches unity (d) Reaches Infinity
9. For measuring very high resistance we use
- (a) Wheatstone bridge (b) Kelvins bridge
(c) Megger (d) Anderson bridge
10. Anderson bridge unknown inductance is measured in terms of
- (a) Known inductance and resistance (b) Known capacitance and resistance
(c) Known inductance (d) Known capacitance

PART - B (5 x 2 = 10 Marks)

11. Classify the Standards.
12. Give the principle of capacitive transducers.
13. What is fiber optic transducer?
14. List the components of a magnetic tape recorder.
15. Name the sources of errors in AC bridge measurements.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail about static characteristics. (16)
- Or
- (b) (i) Describe in detail about any FOUR dynamic characteristics. (8)
- (ii) How errors are classified? Explain about the causes and remedies for each error in detail. (8)
17. (a) Describe in detail about strain gauge with neat diagram and also derive poison's ratio. (16)

Or

- (b) Draw the circuit of LVDT and explain its operation for different conditions. (16)
18. (a) Explain in detail about Piezoelectric transducer with neat diagram. (16)

Or

- (b) Write short notes on: (i) Smart sensor (ii) MEMS sensor. (16)
19. (a) Draw the block diagram of X-Y recorder and explain each part. (16)

Or

- (b) With a neat diagram explain the working of Digital storage oscilloscope. (16)
20. (a) Draw the diagram of following bridge and derive the balanced equation
- (i) Wheatstone bridge (8)
- (ii) Kelvin's double bridge (8)

Or

- (b) With the help of circuit draw the following bridge and derive the balanced equation
- (i) Schering bridge (8)
- (ii) Maxwell bridge (8)
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