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Question Paper Code: 39504

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Elective

Electronics and Instrumentation Engineering

01UEI904 - ADVANCED SENSORS

(Regulation 2013)

Duration: 1.15 hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

- Strain gauge, LVDT and thermocouple are examples of
 - Active transducers
 - Passive transducers
 - Analog transducers
 - Primary transducers
- Two capacitances, $C_1 = (150 \pm 2.4) \mu F$ and $C_2 = (120 \pm 1.5) \mu F$, are in parallel. What is the limiting error of the resultant capacitance C ?
 - $0.9 \mu F$
 - $1.9 \mu F$
 - $3.9 \mu F$
 - $4.8 \mu F$
- A strain gauge is a passive transducer and is employed for converting
 - pressure into a change of resistance
 - force into a displacement
 - pressure into displacement
 - mechanical displacement into a change of resistance
- The desirable static characteristic of a measuring system are
 - Accuracy and reproducibility
 - Accuracy, sensitivity and reproducibility
 - Drift and dead zone
 - Static error

5. Material used for the temperature range of operation (160-400)°C
 (a) platinum (b) copper (c) tungsten (d)nickel
6. Capacitive transducers are normally employed for_____ measurements
 (a) Static (b) Dynamic (c) Transient (d) Both static and dynamic
7. Quartz and Rochelle salt belongs to _____ of piezo-electric materials
 (a) Natural group (b) Synthetic group
 (c) Natural or Synthetic group (d) Fiber group
8. Fiber optic sensor can be used to sense
 (a) Displacement (b) Power (c) Current (d) Resistance
9. Which sensor is used for the detection of objects in a moving conveyor?
 (a) vibration (b) velocity (c) piezoresistive (d) proximity
10. Humidity sensor employed for determination of
 (a) Relative Humidity (b) Bourdon tube
 (c) Temperature (d) Nuclear radiation

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Which sensor is mainly used for gas sensing? Explain in detail. (8)
12. Summarize the application of optical sensor in space and environment. (8)
13. Derive the expression for the response time of the biosensor in a transient state. (8)
14. Mention the steps involved in fabricating the high pressure sensor. Explain with a neat sketch. (8)
15. With suitable diagram, explain the general architecture of smart sensor. (8)