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**Question Paper Code: 33603**

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

Third Semester

Instrumentation and Control Engineering

01UIC303 – SENSOR AND TRANSDUCERS

(Common to Electronics and Instrumentation Engineering)

(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
- Material used for the temperature range of operation (160-400)°C
  - platinum
  - copper
  - tungsten
  - 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. Explain in detail about fundamental units and standards of a measurement system. (8)
12. Distinguish the following static characteristic of transducer  
(i) Resolution Vs Thershold  
(ii) Range Vs Span  
(iii) Sensitivity Vs Zero drift  
(iv) Accuracy Vs Precision. (8)
13. Explain the constructional details and principle of operation of RTD with necessary diagram. Also give its advantages and disadvantages. (8)
14. Explain the construction and working megnetostrictive transducer. (8)
15. Describe the operation and construction and application of vibration sensor. (8)