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**Question Paper Code: 33603**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Third Semester

Instrumentation and Control Engineering

01UIC303 – SENSOR AND TRANSDUCERS

(Common to Electronics and Instrumentation Engineering)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Distinguish between active and passive transducer.
2. Define calibration.
3. Distinguish between accuracy and precision.
4. Define Resolution.
5. List the applications of inductive transducers.
6. Define gauge factor.
7. What is SQUID?
8. What is piezoelectric effect?
9. State the features of smart sensors.
10. List the application of seismic sensor

PART - B (5 x 16 = 80 Marks)

11. (a) (i) A temperature is measured 100 times with variation in apparatus and procedures. After applying the corrections, the results are

Temperature °C	397	398	399	400	401	402	403	404	405
Frequency of occurrence	1	3	12	23	37	16	4	2	2

Calculate the arithmetic mean, mean deviation, standard deviation. (8)

- (ii) The current passing through a resistor of  $400\Omega \pm 3\Omega$ ,  $5 \pm 0.3A$  using the relationship for power dissipation. Calculate the limiting error in the computed power dissipation. (8)

Or

- (b) Discuss in detail about the types of errors. (16)

12. (a) Define the following terms: Accuracy, Precision, Hysteresis, Linearity, Range and Span. (16)

Or

- (b) Derive the mathematical model of a second order transducer for a given impulse input. (16)

13. (a) Explain the constructional details and principle of operation of RTD with necessary diagram. Also give its advantages and disadvantages. (16)

Or

- (b) (i) Discuss the principle and working of variable reluctance transducer. (8)

- (ii) Explain the working of capacitive transducer. (8)

14. (a) Explain how angular displacement is measured using digital transducer. (16)

Or

- (b) What are digital transducers? Classify and explain the various types of digital transducer. (16)

15. (a) Discuss the operation of a sensor with interfacing circuits and capable of performing automatic ranging, auto calibration and automatic decision making. (16)

Or

- (b) (i) What is a Nano sensor? Explain the different manufacturing techniques used in Nano sensors. (8)
- (ii) Describe the working of an IC sensor which is used for measuring temperature. (8)

