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Question Paper Code: 31363

B.E. / B.Tech. DEGREE EXAMINATION, NOVEMBER 2015

Third Semester

Instrumentation and Control Engineering

01UIC303 – SENSORS 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. Write the second order differential equation of transducer with example.
5. Explain working principle of variable reluctance transducer.
6. Write the advantage of capacitive transducer.
7. Define piezoelectric effect.
8. What is magneto strictive effect? Give an example.
9. What is the advantage of nano sensor?
10. What is meant by MEMS?

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) (i) Discuss in detail about the types of errors. (10)

- (ii) Classify the transducer in detail. (6)

12. (a) Explain in detail about static characteristics of transducer. (16)

Or

- (b) Derive the expression of second order transducer for step input. (16)

13. (a) (i) Explain the principle and working of hotwire anemometer in the constant current mode. (8)

- (ii) Discuss the types of strain gauge in detail. (8)

Or

- (b) (i) With neat diagram explain the characteristic and operation of RTD. (8)

- (ii) Describe the construction and working of linear variable differential transformer. (8)

14. (a) Explain construction and operation of digital transducer and also explain its types. (16)

Or

- (b) (i) Explain the construction and operation of HALL effect transducer. (8)

- (ii) Describe the operation of piezoelectric transducer. (8)

15. (a) Discuss in detail about construction and working of SQUID. (16)

Or

- (b) Write in detail about principle working and types of smart sensors. (16)