Reg. No. :

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

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. Why calibration needed for any measuring instrument?

2. Define static calibration.

3. Differentiate between resolution and threshold.

4. Define Resolution.

5. List the applications of inductive transducers.

6. Define gauge factor.

7. What is SQUID?

8. Define magnetostriction.

9. State the features of smart sensors.

10. What are the advantages of nano sensors?

PART - B (5 x 16 = 80 Marks)

11. (a) Explain the factors considered for selection of transducer for a particular application. (16)

Or

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

12. (a) Elaborate the following static characteristics of transducers.

      (i) Sensitivity
      (ii) Linearity
      (iii) Range and Span
      (iv) Hysteresis. (16)

Or

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

13. (a) Explain in detail about the construction and principle of operation of LVDT. State its applications. (16)

Or

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

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

14. (a) Draw the equivalent circuit diagram of a piezo electric crystal and write the expression for the charge generated by the crystal. (16)

Or

(b) Describe in detail about any two application of Hall Effect transducers. (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) With a neat block diagram, explain about the functioning of a smart sensor. (8)

     (ii) Write short notes on MEMS. (8)

33603