53 (IE 502) TREN

2017

TRANSDUCER ENGINEERING

Paper : IE 502

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions from **seven**.*

1. *(a)* Based on the 3 effects classify the transducer ? 10

(b) One hundred temperature reading were taken at small intervals of time and recorded to the nearest 0·5 °*C*. The Frequency of occurrences of the reading is given below : 10

Temperature reading (°*C*)	98·5	99	99·5	100	100·5	101	101·5
Frequency	4	13	19	35	17	10	02

2. *(a)* Derive the Expression for gauge factor. 10

(b) Describe the factors to be considered in the selection of a transducer. 10

3. *(a)* Derive the operational transfer function of a second order instrument. 10

(b) Draw the waveforms of *four* important types of standard test signals with expression ? 6

(c) A thermometer has a time constant of 3·5*sec.* It is quickly taken from a temperature 0°*C* to a water bath having temperature 100°*C*. What temperature will be indicated after 1·5*sec.* ? 4

4. *(a)* Describe the construction, principle and working of thermistor. 10

(b) Explain the principle of operation and construction of hot wire Anemometer. 10

5. *(a)* Explain the measurement of humidity with the help of humidity sensor. 8

(b) Write a note on EI pick up, also give the advantages, disadvantages and applications of LVDT. 12

6. (a) List the characteristics and applications of capacitive transducer. Also explain how it can be used for level measurement. 12

(b) Explain the operation of capacitive microphone. 8

7. (a) Describe the principle of operation of Hall Effect Transducer. 8

(b) Explain with a sketch the working of a fiber-optic displacement transducer. Draw its input-output characteristic. 12