

R16

Code No: 138GY

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, July - 2021

SENSORS AND TRANSDUCERS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 75

Answer any Five Questions

All Questions Carry Equal Marks

- 1.a) Explain the Generalized measuring system and its functional elements with a neat schematic diagram.
b) What do you mean by errors and uncertainties in measurements? [8+7]
- 2.a) Explain the following with respect to Static calibration:
i) Accuracy ii) Precision iii) Sensitivity iv) Drift
b) What do you mean by dynamic response and distinguish between Steady state response and Transient response. [8+7]
- 3.a) Explain the time responses of a first order system and second order system to a step input.
b) Explain why input, transfer and output characteristics are very important when choosing a transducer for any application. [8+7]
- 4.a) Distinguish in detail between Wire wound Potentiometers and Non – wire Potentiometers.
b) What do you mean by Loading effect and how it can be nullified? [8+7]
- 5.a) Explain the working of Rotary variable Differential Transformer (RVDT).
b) A resistance wire strain gauge uses a soft iron wire of small diameter. The gauge factor is +4.6. Neglecting the piezoresistive effects, calculate the Poisson's ratio. [8+7]
- 6.a) List the advantages and disadvantages of Capacitive transducers.
b) A piezo electric crystal having dimensions of $6 \text{ mm} \times 6\text{mm} \times 2\text{mm}$ and a voltage sensitivity of $0.065 \text{ V} - \text{m/N}$ is used for force measurement. Calculate the force if the voltage developed is 120V . [8+7]
- 7.a) Explain the principle of operation of Hall effect transducers with a neat sketch.
b) What are Nano sensors and how it effects the technology in present day scenario. [8+7]
8. Write short notes on the following:
a) Thermistors
b) SYNCHROS
c) Fiber optic Sensors. [15]