CBCS SCHEME

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21EE641



# Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
## Sensors and Transducers

Time: 3 hrs. Max. Marks: 100

***Note: Answer any FIVE full questions, choosing ONE full question from each module.***



### Module-1

1 a. Define a transducer. Give the classification of transducers with suitable examples. **(10 Marks)**

b. The output of LVDT is connected to a 4V voltmeter through an amplifier whose amplification factor is 500. An output of 1.8 mV appears across the terminals of LVDT when the core moves through a distance of 0.6mm. If the mill voltmeter scale has 100 divisions and the scale can be read to $\frac{1}{4}$ of a division, calculate.

i) The sensitivity of LVDT
ii) The resolution of the LVDT **(10 Marks)**

**OR**

2 a. Explain the necessity of transducers. List out the advantages and disadvantages of electrical transducers. **(10 Marks)**

b. Derive the output voltage for a differential capacitor, with a supporting diagram. **(10 Marks)**

### Module-2

3 a. Explain the operation of a pneumatic proximity sensor with a neat diagram. **(10 Marks)**

b. Define MEMS. Explain the block diagram of MEMS with the aid of a block diagram. **(10 Marks)**

**OR**

4 a. Distinguish between the intrinsic and extrinsic optical fiber sensors with supporting diagrams and applications. **(10 Marks)**

b. Briefly explain the manufacturing techniques of MEMS. List out the advantages and applications of MEMS. **(10 Marks)**

### Module-3

5 a. Define signal conditioning. Explain the various functions of signal conditioning circuits. **(10 Marks)**

b. Compare and contrast single-channel DAS with multi-channel DAS with necessary block diagrams. **(10 Marks)**

**OR**

6 a. Explain the differential amplifier using op-amp with a neat circuit diagram. List out its advantages. **(10 Marks)**

b. Define DAS. Explain generalized DAS with a neat block diagram. **(10 Marks)**

## Module-4

7 a. Compare pulse amplitude modulation (PAM) with pulse code modulation telemetry system with their respective block diagrams and explanation. **(10 Marks)**

b. Explain the pirani vacuum gauge with a neat diagram. List out its advantages and disadvantages. **(10 Marks)**

**OR**

8 a. With suitable diagrams, explain the following for their construction and operation:
i) Voltage telemetering system
ii) Basic current telemetering system. **(10Marks)**

b. Explain the operation of ionization gauges with a supporting diagram. List out its advantages and disadvantages. **(10 Marks)**

## Module-5

9 a. Explain the operation of an optical disappearing filament type pyrometer along with its diagram. Mention its uses, advantages and disadvantages. **(10 Marks)**

b. Explain the four types of orifice plates with their supporting diagrams. **(10 Marks)**

**OR**

10 a. Explain the method of level measurement using LASER with a suitable diagram. List its advantages, limitations and applications. **(10 Marks)**

b. With construction, explain the working of a strain-guage torsion meter. Mention its advantage and limitations. **(10 Marks)**

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