

VR23



Reg. No:

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VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, DECEMBER - 2024

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

23EI3305 SENSORS AND TRANSDUCERS

Time: 3 hours

Max. Marks: 70

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

5 x 2 = 10M

1. a. Compare accuracy and precision. **(CO1 K2)**
- b. Identify the factors to be considered for selection of transducer for a particular application. **(CO2 K1)**
- c. List any two uses of capacitive transducer. **(CO3 K1)**
- d. List any two features of polymer sensor. **(CO4 K1)**
- e. Identify the important features of smart sensor. **(CO4 K1)**



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PART-B

4 x 15 = 60M

UNIT-I

2. a. The following values were obtained from the measurement of current: 12.35A, 12.71A, 12.48A, 10.24A, 12.63A and 12.58A. Apply proper methods and calculate:
- i. The arithmetic mean
 - ii. The average deviation
 - iii. The standard deviation
 - iv. Variance. **(CO1 K2) 8M**
- b. Explain about different types of systematic error. **(CO1 K2) 7M**

(or)

3. a. Build a measurement system with required functional elements and explain the necessity of each element in detail with an example. **(CO1 K2) 8M**
- b. Compare and explain static and dynamic characteristics of instrument. **(CO1 K2) 7M**

UNIT-II

4. a. Describe the construction and working of strain gauge. **(CO2 K2) 8M**
- b. Describe the signal conditioning of resistive transducer. **(CO2 K2) 7M**

(or)

5. a. Explain the principle and construction of Thermistor with its temperature characteristics. **(CO2 K2) 7M**
- b. Contrast Linearity and sensitivity of resistive Potentiometers. **(CO2 K3) 8M**

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UNIT-III

6. a. Outline the operation and construction of LVDT with its applications. **(CO3 K3) 8M**
- b. Illustrate the signal conditioning of Inductive transducers. **(CO3 K2) 7M**

(or)

7. a. Assess variable area, variable distance and variable permittivity of Capacitive transducer. **(CO3 K3) 8M**
- b. Explain the principle of change of self-inductance and mutual inductance in variable inductance transducer. **(CO3 K2) 7M**

UNIT-IV

8. a. Discuss the principle of operation of fiber optic sensor with neat diagram. **(CO4 K2) 8M**
- b. Explain the principle of Hall sensor in displacement measurement. **(CO4 K2) 7M**

(or)

9. a. Illustrate the construction and working of IR sensor. **(CO4 K2) 8M**
- b. Explain the operation of ultrasonic sensor in detail. **(CO4 K2) 7M**

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