

17EI3304

b. Discuss about Hall effect sensors in detail. **7M**

(or)

9. a. What is a bio sensor and in what respect it is different from the industrial versions? Discuss about its structure, composition, with a neat diagram. **8M**

b. Write short notes on IR radiation sensors. **7M**

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VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, NOVEMBER, 2018

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

17EI3304 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

10 x 1 = 10M

1.
 - a. What are gross errors?
 - b. Define fidelity.
 - c. A voltmeter has a range of [0 V, 20 V] and a resolution of 1 mV. Find the dynamic range of the voltmeter.
 - d. Comment on sensitivity and linearity of capacitive transducers using change in the area of plates.
 - e. State piezoelectric effect.
 - f. List out the limitations of A.C. tachometer.
 - g. What are the advantages of digital methods for measurement of angular velocity?
 - h. Write the applications of bio sensors.
 - i. What is Peltier effect?
 - j. Draw the configuration of a smart sensor.

PART-B**4 x 15 = 60M****UNIT-I**

2. a. Define an instrument and give an example in line with the definition. Draw the block diagram of generalized instrument system and discuss about the functionality and significance of each block in detail. **7M**
- b. Identify the most probable straight line for the data given below by the method of extended differences. **8M**

X	1	3	5	7	11	14
Y	1	2	4	7	8	10

(or)

3. a. Formulate the mathematical model of first order instrument to step input. **7M**
- b. Discuss about limiting errors. **8M**

UNIT-II

4. a. Discuss in detail about the characteristics of a transducer which should be considered when choosing it for an application. **7M**
- b. Illustrate the operating principle of photovoltaic cell, with a neat diagram. Also, discuss its current vs luminous flux characteristics and advantages. **8M**

(or)

5. a. Describe the constructional details of potentiometer and derive the expression for its output voltage. **7M**
- b. Differentiate between the following with 2 suitable examples in each case, with necessary diagrams
- i) Primary and Secondary transducers
- ii) Active and Passive transducers **8M**

UNIT-III

6. a. Discuss the working of LVDT and how it is used for displacement measurement, with necessary diagrams. **7M**
- b. With a neat diagram, explain the working of photo electric tachometer. Discuss its advantages and disadvantages. **8M**

(or)

7. a. With necessary diagrams, describe the principle of operation of various digital displacement transducers in detail. **8M**
- b. Illustrate the operation of piezoelectric accelerometer with a neat diagram and discuss its advantages. **7M**

UNIT-IV

8. a. What are optical fibers? Show how the fiber optic sensors are constituted for measuring linear and rotary displacement, with necessary diagrams. **8M**