b. Explain in detail about the fiber optic sensors in displacement measurement. **7M**

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Reg. No: | | | | | | | | | | |

VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, NOVEMBER, 2019

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

17EI3304 SENSORS AND TRANSDUCERS

Time: 3hours ***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. Differentiate the terms range and span.
   b. What is meant by gross error?
   c. How errors caused by loading effect can be reduced?
   d. Give the difference between active and passive transducers.
   e. List out different applications of variable capacitive type transducers.
   f. Define Seebeck effect.
   g. List out three applications of resistive transducers.
   h. List out the methods used for velocity measurement.
   i. Define principle of photodiode.
   j. Mention three applications of smart sensors.

PART-B

4 x 15 = 60M

UNIT-I

2. a. Explain in detail about the static characteristics of measuring system with relevant examples. **8M**

   b. Derive the transfer function in discrete time domain for first order system and explain its behavior to step input. **7M**

(or)

3. a. Identify the most probable straight line for the data given below by the method of sequential differences **8M**

x	1	4	5	7	12	15
y	1	3	6	8	9	10

   b. Explain briefly about dynamic characteristics of measurement system with suitable examples. **7M**

UNIT-II

4. a. Explain the principle of operation of stain gauge and derive its gauge factor. **8M**

   b. Explain how displacement can be measured using variable capacitive transducer? **7M**

(or)

5. a. Explain in detail about the classification of transducers. **8M**

   b. Explain the operation of variable resistive type transducer. **7M**

UNIT–III

6. a. With neat schematic diagram, illustrate the operation of electromagnetic tachometer. **8M**

   b. Discuss about the measurement of displacement using Flapper nozzle transducers with neat sketch. **7M**

(or)

7. a. With the help of neat block diagram, explain the operation of peizoelectric accelerometer. **7M**

   b. Explain in detail about construction and operation of LVDT. **8M**

UNIT-IV

8. a. With a neat sketch, explain the operation of Hall effect sensor and how it is used in displacement measurement? **7M**

   b. What are biosensors? List their applications. Illustrate the structure of biosensor. **8M**

(or)

9. a. With a neat block diagram, explain in detail about construction and operation of Doppler ultrasonic flow meter. **8M**