VR14 Reg. No: | | | | | | | | | | |

VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

II/IV B.Tech. DEGREE EXAMINATION, NOVEMBER, 2017

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

14EI3305 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 is the difference between range and span?
   b. What is meant by drift in an instrument?
   c. How the errors caused by the loading effects can be reduced?
   d. What is the difference between active transducer and passive transducer?
   e. What is the principle of piezoelectric pick up?
   f. What is the principle of manetostriction transducer?
   g. What kind of transducers used for sensing acceleration?
   h. What is the principle behind the Hall effect sensor?
   i. What are the applications of polymer sensors?
   j. What is meant by smart sensor?

PART-B

4 x 15 = 60M

UNIT-I

2. a. Outline the operation of generalized instrument system. **7M**

   b. What is precision? How it differs with accuracy? Explain with an example. **4M**

   c. Derive the transfer function for a first order system. **4M**

(or)

3. a. Explain briefly about various errors that occur during measurements. **7M**

   b. In a test, temperature is measured 100 times as shown in table below **8M**

Temp in 0^0C	397	398	399	400	401	402	403	404	405
Fq of accuracy	1	3	12	23	37	16	4	2	2

Compute arithmetic mean, standard deviation, probable error and probable error of mean.

UNIT-II

4. a. What are the types of capacitive transducers? Mention the principle of operation and their typical applications. **6M**

   b. Derive the expression for gauge factor of strain gauge. **9M**

(or)

5. Explain the different types of inductive transducers. **15M**

UNIT-III

6. a. Explain displacement measurement using flapper nozzle transducer. **7M**

   b. With neat diagram, explain the operation of LVDT. **8M**

(or)

7. a. With a neat schematic, illustrate the operation of potentiometric vibrometer. **7M**

   b. Illustrate the principle of operation of AC tachometer generator. List its advantages and limitations. **8M**

UNIT-IV

8. a. What are the different types of bio sensors and explain them briefly? **8M**

   b. What is the principle and operation of IR radiation sensor? **7M**

(or)

9. a. What is the principle and operation of semiconductor sensors fabrication procedure? **5M**

   b. Explain briefly about the fibre optic sensors for measurement of displacement, level. **10M**

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