9. Write short notes on

a. Semiconductor gas detectors **5M**

b. Ion selective electrodes **5M**

c. Conductometric sensors **5M**

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VR14

14EI3305

II/IV B.Tech. DEGREE EXAMINATION, NOVEMBER, 2015

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

SENSORS AND TRANSDUCERS

Time: 3hours ***Max. Marks: 70***

Part-A is compulsory

Answer One Question from each Unit of Part-B

PART-A

10 x 1 = 10M

1. a. What is the difference between accuracy and precision?

b. What are undesirable characteristics?

c. List the dynamic characteristics of simplified measuring system.

d. What is the principle of pneumatic transducers used for displacement measurement?

e. Define Hall Effect.

f. List the functional elements of a measuring system.

g. What are limiting errors?

h. Mention some instruments that measure angular velocity.

i. What is electromagnetic effect?

j. What are digital transducers?

PART-B

4 x 15 = 60M

UNIT-I

2. a. Explain the dynamic response of first order instruments to step input. Draw the response. **7M**

   b. Draw the block diagram of generalized instrument system and explain in detail. **8M**

(or)

3. a. Explain the following terms **8M**

   i) Speed of response

   ii) Overshoot

   iii) Peak time

   iv) Settling Time

   b. Define and explain the types of static errors possible in an instrument. **7M**

UNIT-II

4. Explain the construction and principle of operation of

   a. Variable resistance type transducers **8M**

   b. Thermoelectric transducers **7M**

(or)

5. Explain with example the working principle of variable capacitance transducers interms of

   a. Change in Area **5M**

   b. Change in Distance **5M**

   c. Change in Dielectric **5M**

UNIT–III

6. a. What is velocity? With a neat diagram, explain the principle and operation of stroboscope in velocity measurement. **7M**

   b. Explain with diagram the principle of any two accelerometers. **8M**

(or)

7. a. What are vibrometers? Explain the construction, principle and operation of potentiometer type vibrometer. **8M**

   b. Explain with schematic diagram the working principle of Incremental type encoders for displacement measurement. **7M**

UNIT–IV

8. a. Explain with necessary diagram the use of IR radiation sensors for temperature measurement. **8M**

   b. What are biomedical sensors? Explain the principle and operation of SAW sensors with a suitable diagram. **7M**

(or)