



B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2013)

Third Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U13EIT302: Sensors and Transducers

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Self generating type transducers are _____ transducers.
 - a) Active
 - b) Passive
 - c) Secondary
 - d) Inverse
2. SI unit of Luminous Intensity is
3. Among the following options, which one is not dynamic characteristics
 - a) Measured Lag
 - b) Fidelity
 - c) Speed of response
 - d) Drift
4. Order of liquid in glass thermo meter is.....
5. In wire wound strain gauges, the change in resistance is due to
 - a) Change in diameter of the wire
 - b) Change in length of the wire
 - c) Change in both length and diameter
 - d) Change in resistivity
6. Humidity sensor measures
7. Capacitive transducers are normally employed for_____ measurements
 - a) Static
 - b) Dynamic
 - c) Transient
 - d) Both static and dynamic
8. Phase difference between two output voltage in LVDT is.....
9. Which of the following can be measured with the help of piezoelectric crystal?
 - a) Velocity
 - b) Sound
 - c) Force
 - d) Mass
10. transducers is an active optical transducers

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

11. Divide systematic errors
12. Classify the units
13. Identify any four static characteristics
14. Define precision
15. Examine the requirements of conductor material to be used in RTD
16. Summarize Piezoresistive effect
17. List the proximity sensor based on working principle
18. Predict the variation of output voltage with linear displacement for an LVDT
19. Tell about magnetostriction effect
20. Discuss the principle of Hall effect

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. Identify the functional elements of measurement system and using this concept construct elemental blocks for any instrument or system.

22. a) (i) Build with necessary equations step response of first order instruments (8)
(ii) Outline the following terms (6)
 - a) Speed of Response
 - b) Fidelity
 - c) Lag

(OR)

- b) (i) Develop the ramp response of first order system with necessary equations (8)
(ii) Define drifts and explain each drift with its Characteristics (6)

23. a) Explain the theory of strain gauge, also discover the parameter that decides the gauge factor

(OR)

- b) (i) Illustrate the construction, working principle and characteristics of Thermistor. (8)
(ii) Elaborate about LDR and resistive humidity sensor with working principle (6)

24. a) (i) Develop a block diagram to measure the speed using Variable Reluctance Speed sensor and explain it. (10)
- (ii) Choose any four advantages variable reluctance speed sensor. (4)

(OR)

- b) Justify that the differential arrangement of capacitors can be used to measure linear displacement

25. a) (i) Design a system to measure the temperature using fiber optics using (10)
- i) Phase difference method
- ii) Without beam splitter and mirror
- (ii) List any four advantages of MEMS (4)

(OR)

- b) Discuss in detail about pressure measurement using Piezoelectric transducer, also mention its advantages and disadvantages
