Reg. No. :

Question Paper Code : 70076

7/11/2020

M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

First Semester

Applied Electronics

AP 5101 – SENSORS, ACTUATORS AND INTERFACE ELECTRONICS

(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions

PART – A **(10×2=20 Marks)**

1. Define the term Accuracy and Precision.
2. With an example explain zero order system.
3. Define CMRR.
4. Write the principle of Hall effect sensors.
5. Brief any two properties of Piezo-electric crystals.
6. Draw the circuit diagram of low drift amplifier.
7. Write the working principle of a Relay.
8. State the advantages of 4–20 mA current signals when compared with other types of signals.
9. List out any four applications of fiber optic sensor.
10. Write the working principle of magneto diodes.

PART – B **(5×13=65 Marks)**

11. a) Discuss in detail various types of errors associated in measurement and how these errors can be minimized. **(13)**

(OR)

b) Find the time response of second order system for underdamped condition when the input is unit step. **(13)**

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12. a) With necessary sketch explain different types of resistive sensor. **(13)**

(OR)

b) i) Explain the construction and working of LVDT with a neat sketch. **(8)**

ii) List out the sources of interference in resistive sensor unit. **(5)**

13. a) Explain the operation principle of pyroelectric sensor and give its application. **(13)**

(OR)

b) With circuit diagram explain the working principle of charge amplifier and discuss the advantages of charge amplifier. **(13)**

14. a) Explain the construction and working principle of synchros error detector. **(13)**

(OR)

b) Explain the working principle of Control Valve and its characteristics. **(13)**

15. a) Discuss the working principle of following digital sensors :

i) Position Encoder **(7)**

ii) Variable frequency sensors. **(6)**

(OR)

b) Discuss the unique advantages and application of following semiconductor device sensors :

i) Ultrasonic sensor **(7)**

ii) Photo transistor. **(6)**

PART – C **(1×15=15 Marks)**

16. a) Construct a signal conditioning unit to measure the temperature using resistive temperature detector. **(15)**

(OR)

b) Discuss about different types of electric actuator and its applications. **(15)**