Reg. No. :

## Question Paper Code : X 85080

M.E./M.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

First/Third 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 precision and sensitivity of a measurement system.

2. List out the classification of sensors in measuring instruments.

3. Write the practical applications of a strain gages.

4. Mention the need for hall effect sensors.

5. Draw the characteristic curve of a PV cell.

6. Mention the uses of Piezoelectric sensor.

7. Compare stepper motors with servo motors.

8. What are synchros ? And mention their uses.

9. Draw the block diagram of digital flow meter.

10. Specify some applications of ultrasonic sensors.

PART – B                                                         (5×13=65 Marks)

11. a)  i) Explain the static characteristics of a measurement system.                **(6)**
        ii) Describe about the general I/O configuration of an instrumentation
            system.                                                                   **(7)**

                    (OR)

    b)  i) Write short notes on static errors and random errors.                      **(6)**
        ii) Illustrate the response of second order measurement systems with a neat
            sketch.                                                                   **(7)**

**X 85080**

12. a) i) Comment about potentiometers and LDR's. **(6)**
     ii) Explain in detail about the working principle of a Wheatstone bridge. **(7)**

(OR)

   b) i) Describe about electromagnetic sensors and capacitive sensors. **(6)**
     ii) Discuss the working of an LVDT with a neat diagram. **(7)**

13. a) Explain in detail about various self generating sensors used in an instrumentation system.

(OR)

   b) Elaborate various instrumentation amplifiers that are used in measurement systems.

14. a) i) Write short notes on relays and solenoid drives. **(6)**
     ii) Explain the operation of a stepper motor with necessary diagrams. **(7)**

(OR)

   b) i) Briefly discuss about hydraulic actuators and resolvers. **(6)**
     ii) Illustrate the working of a servo motor and mention its applications. **(7)**

15. a) i) Briefly describe about quartz digital thermometer. **(6)**
     ii) Comment in detail about vibrating cylinder sensors. **(7)**

(OR)

   b) i) Write a brief note on photodiodes and photo transistors. **(6)**
     ii) Explain in detail about MOSFET based sensors for measuring systems. **(7)**

PART – C  (1×15=15 Marks)

16. a) Explain in detail about practical thermoelectric and Pyroelectric sensors used in an instrumentation system.

(OR)

   b) Elaborate in detail about various photodiodes and phototransistors utilized in industrial processes.

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