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

Question Paper Code : 40080

M.E./M.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

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. State the difference between accuracy and precision of a measurement.

2. What are primary and secondary measurements?

3. Define gauge factor of strain gauge.

4. What is Hall effect?

5. List any four piezo-electric material.

6. Write any two source of interference and reduction technique.

7. Give the features of servo motors.

8. State the relay principle.

9. Write the merits and demerits of digital flow meter.

10. Write the applications of the CCD imaging sensors.

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) Obtain the time response of second order instruments for unit step input, under damped condition and list its specification. (13)

12. (a) With necessary sketch explain the operating principle and characteristics of LVDT. (13)

Or

(b) (i) Explain different strain gauges with their principle of operation. (7)

(ii) Write the principle of capacitive sensors and give its applications. (6)

13. (a) Write technical notes on following sensors :

(i) Pyroelectric sensors. (7)

(ii) Photovoltaic sensors. (6)

Or

(b) With help of circuit diagram explain any two amplifiers used in signal conditioning for self generating sensors and give its significance. (13)

14. (a) Explain the principle and applications of syncros and inductosyn. (13)

Or

(b) Explain the following with diagram :

(i) Hydraulic actuators. (7)

(ii) Solenoid drive. (6)

15. (a) Explain following digital sensors principle of operation and application.

(i) Position encoder. (7)

(ii) Vibrating cylinder sensors. (6)

Or

(b) With necessary sketch explain principle and applications of

(i) Ultrasonic sensors. (7)

(ii) Fiber-optic sensors. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Develop a digital signal conditioning system to measure the temperature using resistive sensors. Discuss challenges and issues. (15)

Or

(b) Discuss the role of Resolver-to-Digital Converters in angular displacement control system. Mention the characteristics and applications. (15)