

Reg. No. :

**Question Paper Code : 10182**

M.E./M.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

First Semester

Applied Electronics

AP 5101 — SENSORS, ACTUATORS AND INTERFACE ELECTRONICS

(Regulation 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are cause and effect of systematic errors and random errors.
2. Why are systems subject to dynamic characterisation?
3. Write the application of magneto elastic sensor.
4. Mention the criteria to choose a sensor.
5. Describe noise in an amplifier.
6. What is need for signal conditioning?
7. Compare accuracy and resolution in measurement.
8. Explain the principle of synchros.
9. Write briefly on quartz digital thermometer.
10. What is a magneto diode?

PART B — (5 × 13 = 65 marks)

11. (a) Explain in detail about measurement systems. (13)

Or

- (b) Elaborate static and dynamic characteristics of measurement systems and discuss this for calibrating an ammeter. (7 + 6)

12. (a) (i) Describe the performance of a strain gauge constructed with bridge circuit and bring out a practical application with a neat circuit. (6)  
(ii) Explain the instrumentation amplifier and its application in detail. (7)

Or

- (b) (i) Draw and explain LVDT. List its application. (6)  
(ii) Differentiate capacitive and inductive sensors. (7)
13. (a) Explain the following in detail  
(i) Photovoltaic sensors (6)  
(ii) Pyroelectric sensors. (7)

Or

- (b) Write notes on:  
(i) Chopper and low drift amplifiers (6)  
(ii) Electrometer amplifiers. (7)
14. (a) (i) Describe the operation of digital to resolver converters.  
(ii) Stepper motor control as an actuator.

Or

- (b) (i) Formulate the working of solenoid drive. (6)  
(ii) Discuss in detail about inductosyn. (7)
15. (a) (i) Illustrate the features of CCD imaging sensors. (6)  
(ii) Explain the vibrating wire strain gauges and vibrating cylinder sensors. (7)

Or

- (b) (i) Describe the functioning of position encoder and mention its use. (6)  
(ii) Write short notes fibre optic sensors. (7)

PART C — (1 × 15 = 15 marks)

16. (a) A variable resistance potentiometer having a resistance of 9 Kilo Ohm is connected to a DC voltage source of 40 V. The voltage output of the transducer is measured by means of a voltmeter of internal impedance of 80 kilo Ohm. Determine the impedance loading error at 15% position on the transducer and the actual voltage reading observed at this position. (15)

Or

- (b) Analyze in detail about Ultrasonic sensors and Digital flow meters. (15)