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Question Paper Code: 39504

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Elective

Electronics and Instrumentation Engineering

01UEI904 - ADVANCED SENSORS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. List the three basic components of a chemical sensor.
2. Draw the structure of an ion selective electrode.
3. What is echolocation?
4. Write the types of optical sensor.
5. State the principle of biosensor.
6. Define NFET sensors.
7. Give the advantages of catheter pressure sensor.
8. Mention the use of resolvers.
9. Compare touch sensing and tactile sensing.
10. List the few applications of smart sensors.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Explain with neat diagram operation and principle of hydrogen sensitive MOSFET. (10)
- (ii) Discuss in detail the importance of sensor matrix for Two dimensional measurement of concentration. (6)

Or

- (b) Which sensor is mainly used for gas sensing? Explain in detail. (16)

12. (a) Define echolocation. Explain the working principle of echolocation and its applications. (16)

Or

- (b) Explain the working principle of holographic sensors. (16)

13. (a) Derive the expression for the response time of the biosensor in a transient state. (16)

Or

- (b) (i) Explain in detail about pCO₂enzyme sensor. (8)

- (ii) Describe the operation and principle of any one type of semiconductor enzyme sensor. (8)

14. (a) (i) Write short notes on resolver and servos. (8)

- (ii) Discuss in detail the principle of operation of silicon accelerometer. (8)

Or

- (b) With neat sketch explain any one type of pressure sensor. (16)

15. (a) Discuss in detail about data acquisition and interfacing methods for smart sensors. (16)

Or

- (b) Explain how the temperature is measured using the smart sensors. (16)