

IV B. Tech I Semester Regular Examinations, November – 2022**SMARTSENSORS****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 75**

*Answer any FIVE Questions
ONE Question from Each unit
All Questions Carry Equal Marks*

UNIT-I

- 1 a) List out different Static characteristics of measuring instrument and explain them [7]
b) What is Calibration and explain its importance [8]
(OR)
- 2 a) Explain the different Instrument Types for measuring instrument in detail [7]
b) Explain different random errors in detail [8]

UNIT-II

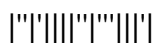
- 3 a) What is Piezoelectric effect? Explain the concept of Piezoelectric along with circuit diagram [7]
b) Explain the concept of Resistance Temperature Detectors in detail [8]
(OR)
- 4 Explain the following Sensors in detail [15]
(i) Thermistors (ii) Strain Gauges (iii) Piezoelectric Force

UNIT-III

- 5 a) Explain the operation of Acceleration Sensors along with circuit diagram [7]
b) Write short notes on Heated-Gas Accelerometer in detail [8]
(OR)
- 6 Explain the following terms in detail [15]
(i) Thermal Accelerometers (ii) Piezoelectric Accelerometers

UNIT-IV

- 7 a) Explain the importance of Acoustic Sensors along with circuit diagram [7]
b) Draw and explain the operation of Phototransistor in detail [8]



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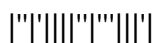
Set No. 1

(OR)

- 8 Explain the following terms in detail [15]
(i) Coriolis Mass Flow (ii) Resistive Microphones

UNIT-V

- 9 a) Derive the Relationship between computation and communication. [7]
b) Explain the concept of Power consumption of sensor in detail. [8]
- (OR)
- 10 a) List out different Challenges for wireless sensor networks and explain. [7]
b) Explain the concept of Energy consumption of Sensor nodes in detail [8]



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UNIT-I

- 1 a) Explain briefly about static and dynamic characteristics. [7]
 b) Explain the different Sources of systematic errors in detail [8]
 (OR)
- 2 a) Explain the different elements for choosing appropriate measuring instruments in detail. [7]
 b) Explain the humidity Calibration method in detail. [8]

UNIT-II

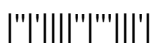
- 3 a) Explain the concept of Mercury Pressure Sensors along with diagram. [7]
 b) Write short notes on Optical Hygrometer in detail. [8]
 (OR)
- 4 a) Explain the importance of Humidity Sensors along with circuit diagram [7]
 b) List out different applications of Moisture Sensors in detail [8]

UNIT-III

- 5 a) Explain the operation of Microwave Motion sensor along with circuit diagram [7]
 b) Explain the importance of Level Sensors in detail [8]
 (OR)
- 6 a) Explain the importance of Piezoelectric Accelerometers along with circuit diagram [7]
 b) Write short notes on Piezoelectric Cables in detail [8]

UNIT-IV

- 7 a) Explain the Chemical Sensors importance in pharmaceutical industries along with one example [7]
 b) Write short notes on Mass Detector in Chemical Sensor [8]



- (OR)
- 8 Explain the following terms in detail [15]
(i) Photodiodes (ii) Phototransistor (iii) Photoresistors

UNIT-V

- 9 Explain the Design principles of Wireless sensor network along with block diagram [15]
- (OR)
- 10 a) Explain the different Optimization goals of wireless sensor networks in detail [7]
b) Explain the Relationship between computation and communication [8]



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UNIT-I

- 1 a) Explain the concept of reduction and quantification of systematic errors in detail. [7]
b) Write short notes on Sources of systematic error in detail [8]
(OR)
- 2 Explain the following terms in detail [15]
(i) secondary calibration (ii) field calibration

UNIT-II

- 3 a) Explain the concept of Optical Hygrometer along the circuit diagram [7]
b) Explain the importance of Strain Gauges in detail [8]
(OR)
- 4 a) Explain the importance of Force Sensors along with circuit diagram [7]
b) What is Thermal Conductivity and explain [8]

UNIT-III

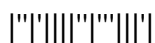
- 5 a) What is Capacitive Accelerometers? Explain the operation of Capacitive Accelerometers in detail [7]
b) Write short notes on Ultrasonic Sensor in detail [8]
(OR)
- 6 a) Explain the operation of Far-Infrared Motion along with one example [7]
b) Write short notes on Thermal Accelerometers in detail [8]

UNIT-IV

- 7 a) Explain the Chemical Sensors importance in oil and gas industries along with one example. [7]
b) Write short notes on Coriolis Mass Flow in detail [8]
(OR)
- 8 Explain the following terms of Chemical Sensors in detail [15]
(i) Potentiometric (ii) Conductometric (iii) Amperometric

UNIT-V

- 9 List out different enabling technologies for wireless sensor networks and explain any one technique in detail [15]
(OR)
- 10 a) Draw the Sensor Network Architecture and explain each block in detail [7]
b) Write short notes on figures of merit [8]



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UNIT-I

- 1 a) List out different Performance Characteristics of Measuring instrument in detail [7]
b) Write short notes on Primary calibration in detail [8]
(OR)
- 2 a) Explain the temperature Calibration method in detail [7]
b) Write short notes on following terms in detail [8]
(i) Static characteristics (ii) dynamic characteristics

UNIT-II

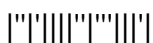
- 3 a) Explain the operation of Optoelectronic sensor along with circuit diagram [7]
b) List out different applications of Optical Sensor in detail [8]
(OR)
- 4 Explain the following terms in detail [15]
(i) Silicon Resistive sensors (ii) Thermo-resistive sensors

UNIT-III

- 5 a) Explain the operation of PIR Motion Sensor along with circuit diagram [7]
b) Write short notes on Gyroscopes sensor in detail [8]
(OR)
- 6 Explain the following terms in detail [15]
(i) Heated-Gas Accelerometer (ii) Heated-Plate Accelerometer

UNIT-IV

- 7 a) Explain the operation of Pressure Gradient Technique of a Flow sensor along with circuit diagram [7]
b) Write short notes on Resistive Microphones in detail [8]



(OR)

- 8 Explain the following terms in detail [15]
(i)Metal-Oxide Chemical (ii) Electro-chemical

UNIT-V

- 9 a) List out different Challenges for wireless sensor networks in detail [7]
b) Explain the operation of Gateway-concepts of wireless sensor networks [8]
(OR)
10 a) Briefly explain the concept of Service interfaces of WSNs in detail [7]
b) Explain the different Applications for wireless sensor networks [8]

JNTU FAST UPDATES

