Printed Pages: 02 **Sub Code:KOT051**

Paper Id: 231683 **Roll No.**

B.TECH.
(SEM V) THEORY EXAMINATION 2022-23
SENSORS, ACTUATORS AND SIGNAL PROCESSING

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2x10 = 20

(a) Name the Environmental Parameters of Sensors.
(b) Write the characteristics of Transducers.
(c) How Thermal Sensor works?
(d) Write the use of Flow Meter in sensors.
(e) Write the basic characteristics of radiation sensor.
(f) Explain the use of filters in sensors.
(g) Define the type of Motions in Actuations systems.
(h) How Mechanical Switches works?
(i) How to Define Signal in terms of waves?
(j) Write the features of Digital Signal Processor.

SECTION B

2. Attempt any *three* of the following: 10x3 = 30

(a) Explain the concept of sensitivity and linearity of Sensors in detail.
(b) Discuss about the Hall effect and how it correlate with the working of sensors?
(c) Explain the working principles of standard hydrogen electrodes in detail.
(d) How D.C Motors works? Explain its working principle with proper diagram.
(e) Define Nyquist Rate. Discuss the different kind of sampling techniques used in signal processing.

SECTION C

3. Attempt any *one* part of the following: 10x1 = 10

(a) Explain the Different type of inductive sensors with proper diagrams.
(b) Discuss the use of Ultra Sonic Sensors and how it is differ from other Sensors?

4. Attempt any *one* part of the following: 10 x1 = 10

(a) Illustrate the Magnetic Sensors and the its working principles in detail.
(b) Explain the mechanisms of Resistance change type Thermometric Sensors.

5. Attempt any *one* part of the following: 10x1 = 10

(a) Discuss various type of Photosensistors and its characteristics.
(b) Define Smart Sensors. Discuss about the Standards for Smart Sensor Interfaces.

6. Attempt any *one* part of the following: 10x1 = 10

(a) Differentiate Between A.C Motor and Stepper Motor. Discuss the mechanisms of stepper motor rotations.
(b) Illustrate about the Pneumatic and Hydraulic Actuations system.

7. Attempt any *one* part of the following: 10x1 = 10

(a) How Spectral Density calculates? Explain the representation of signal in mathematical form.
(b) Explain the classification of Signal Processing Systems in detail.