Subject Code: KEE052

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM V) THEORY EXAMINATION 2023-24
SENSORS AND TRANSDUCERS

TIME: 3 HRS **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

Q no.	Question	Marks	CO
a.	State the difference between a sensor and a transducer.	2	1
b.	Point any two advantages of electrical transducers.	2	1
c.	State any two properties of a thermocouple.	2	2
d.	Explain the full form of RTD. How it is different from a thermistor?	2	2
e.	What are imaging sensors?	2	3
f.	Why image processing is needed?	2	3
g.	What is the need of signal conditioning of a signal?	2	4
h.	Give the applications of digital to analog converter.	2	4
i.	Explain self-calibration feature of smart sensor.	2	5
j.	What is the need of industrial robots?	2	5

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a.	Give classification of transducers.	10	1
b.	Explain the working of proximity sensor as accelerometer. Also explain vibration sensor.	10	2
c.	Examine imaging sensors: CCD and CMOS in detail.	10	3
d.	Explain data acquisition system with suitable example.	10	4
e.	Describe general structure of smart sensors.	10	5

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a.	What is the need of optical encoder? Also explain its working.	10	1
b.	Explain measurement of pressure using LVDT based diaphragm.	10	1

4. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Explain the difference between thermistor and RTD.	10	2
b.	What is the concept of thermal imaging? Also explain its applications in various fields.	10	2

5. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Explain the difference between machine vision and computer vision.	10	3
b.	Determine the need of training the vision system in a pick and place robot.	10	3

6. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Explain functions of signal conditioning equipment.	10	4
b.	Explain counters and timers. Write difference between timer and counter.	10	4

7. Attempt any *one* part of the following: **10 x 1 = 10**

a.	Describe applications of smart sensors in smart cities.	10	5
b.	Describe present scenario of electric vehicles in India.	10	5