PAPER ID-310903

Subject Code: KOE034

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

B TECH
(SEM-III) THEORY EXAMINATION 2020-21
SENSOR AND INSTRUMENTATION

Time: 3 Hours ***Total 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.	classify the types of sensors	2	CO 1
b.	Explain piezoelectric sensor.	2	CO 1
c.	What is the Concept of thermal imaging?	2	CO 2
d.	Draw characteristics for Thermocouple.	2	CO 2
e.	Mention the role of software's in Virtual Instrumentation.	2	CO 3
f.	Define Clusters.	2	CO 3
g.	Explain Data Acquisition.	2	CO 4
h.	What is the Use of Data Sockets for Networked Communication?	2	CO 4
i.	Give few Applications of smart sensors.	2	CO 5
j.	Define Intelligent Sensors.	2	CO 5

SECTION B

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

Q no.	Question	Marks	CO
a.	How can you classify sensors? Explain each of them in detail. Give their suitable application with examples.	10	C0 1
b.	Explain the working of Inductive type Proximity sensors.	10	CO 2
c.	Differentiate between 'traditional instruments' and 'virtual instruments.	10	CO 3
d.	Explain successive approximation for analog to digital conversion.	10	CO 4
e.	What are the various applications of smart sensors? Explain any one in detail.	10	CO 5

SECTION C

3. Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	With the help of a neat sketch explain the working of a 'LVDT'. What are its advantages and disadvantages?	10	C0 1
b.	A Strain Gauge having a Resistance of 120Ω gauge factor of 2 is connected in series with a ballast resistance of 120 Ω across a 12v supply. Calculate the difference between the output voltage (voltage across strain gauge) with no stress applied & with a stress of 140 MN/m^2, Modulus of elasticity of the member undergoing strain is 200GN/ m	10	C0 1

4. Attempt any *one* part of the following:

a.	Briefly describe a 'Capacitive-type' level sensor.	10	CO 2
b.	Explain the working of ultrasonic and laser flow sensor.	10	CO 2

5. Attempt any *one* part of the following:

a.	Explain array and its function in detail.	10	CO3
b.	Draw the architecture of Virtual Instrumentation and indicate the parts.	10	CO3

6. Attempt any *one* part of the following:

a.	Explain the working of R-2R Ladder type for Digital to analog conversion.	10	CO 4
b.	Draw and explain a DAQ system with a neat block diagram.	10	CO 4

7. Attempt any *one* part of the following:

a.	Explain the General Structure of smart sensors & its components.	10	CO 5
b.	Discuss the various Characteristic of smart sensors.	10	CO 5