Sub Code:KOE034

Paper Id: 199358 Roll No:

B.TECH
(SEM III) THEORY EXAMINATION 2019-20
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**

Qno.	Question	Marks	CO
a.	Define and explain accelerometer.	2	CO2
b.	Enlist the classification of errors.	2	CO4
c.	What do you mean by virtual instrumentation system?	2	CO3
d.	What is the concept of smart sensors? Where can they be used?	2	CO5
e.	What are basic elements of measurement system	2	CO1
f.	Discuss a Plug in DAQ device?	2	CO4
g.	What is the use of Data sockets for Networked communications	2	CO4
h.	Give the types of signals that can be acquired by DAQ	2	CO4
i.	Distinguish chart and graph	2	CO3
j.	Distinguish between commercial Instruments and traditional Instruments	2	CO3

SECTION B

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

Qno.	Question	Marks	CO
a.	Explain the feature of Lab VIEW and how it can be used to measure the input signal	10	CO3
b.	Explain the position measurement using hall effect sensors.	10	CO2
c.	Explain the working principle of different types of flow sensors. Differentiate between Ultra Sonic and Electomagnetic type flow sensors.	10	CO2
d.	Explain the smart sensors used for automatic robot control	10	CO5
e.	Explain the concept of virtual Instrumentation. Explain software based virtual Instruments	10	CO3

SECTION C

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

Qno.	Question	Marks	CO
a.	Explain the working principle of linear potentiometric displacement sensor and derive the expression for output voltage	10	CO1
b.	Explain the principle and working of a strain gauge. Derive the expression of gauge factor.	10	CO1

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

Qno.	Question	Marks	CO
a.	What is RTD? How RTD works? Write the types and wiring configuration of RTD	10	CO2
b.	Explain the types of proximity sensors and describe their use as accelerometer and vibration sensor	10	CO2

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

Qno.	Question	Marks	CO
a.	Write an example of while and for loops in graphical programming techniques	10	CO3
b.	Describe state machine for handling RS-485 serial communication protocol	10	CO3

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

Qno.	Question	Marks	CO
a.	Draw and explain the basic block diagram of data acquisition system.	10	CO4
b.	Explain the successive approximation and sigma delta methods of analog to digital converters.	10	CO4

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

Qno.	Question	Marks	CO
a.	Explain general structure of smart sensors and its components	10	CO5
b.	Write the application of smart sensors in automatic robotic control and & automobile engine control	10	CO5