PAPER ID-310411

Subject Code: KCE056

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

B TECH
(SEM-V) THEORY EXAMINATION 2020-21
SENSOR AND INSTRUMENTATION TECHNOLOGIES FOR CIVIL ENGINEERING APPLICATIONS

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.	What do you mean by the purpose of the measurement?	2	
b.	Explain different displacement sensor with examples.	2	
c.	What is Gauge Factor in Strain Gauge?	2	
d.	Differentiate between Permanent installations & Temporary installations of sensors.	2	
e.	Explain in brief time domain signal processing.	2	
f.	What are the different types of strain gauge?	2	
g.	What do you mean by measurement uncertainty?	2	
h.	Draw Sample & Hold circuit & explain its purpose in Instrumentation.	2	
i.	List the conclusion about the physical process based on analysis of sensor data.	2	
j.	What do you mean by Discrete signal?	2	

SECTION B

2. Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	Write a short note: i) Sensor Specifics, ii) Permanent installations, iii) Temporary installations	10	
b.	What is strip chart recorder? Describe its working also write its advantages & disadvantages.	10	
c.	Explain the Working of LCD and differentiate between light scattering and field effect types of LCD.	10	
d.	Explain the function of a Telemetry system with the help of a block diagram. Explain each block in detail.	10	
e.	Explain the working principal of different types of flow sensors. Differentiate between Ultrasonic & Electromagnetic type of Flow Sensors.	10	

SECTION C

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

Q no.	Question	Marks	CO
a.	Differentiate between types of sensors and their modes of operation and measurement.	10	
b.	Different types of sensors used for building projects.	10	

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

Q no.	Question	Marks	CO
a.	Explain differentiate between sensors & Transducer. Give a classification & characterization of the transducers.	10	
b.	Discuss in detail Sensor selection, Sensor Installation & Configuration for a project.	10	

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

Q no.	Question	Marks	CO
a.	What are the advantages and disadvantages of LVDT?	10	
b.	What are the advantages and disadvantages of resistance thermometers (RTD)?	10	

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

Q no.	Question	Marks	CO
a.	What are Recorders? Describe the working of strip chart recorder. Also write its advantages and disadvantages.	10	
b.	Differentiate between ADC & DAC. Explain the working of sample and hold circuit.	10	

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

Q no.	Question	Marks	CO
a.	Explain the need for frequency domain analysis and its principles in detail.	10	
b.	Write a short note on: i) Noise reduction with filters, ii) Leakage, iii) Frequency resolution.	10	