PAPER ID-411033

Subject Code: KEE052

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

BTECH
(SEM-V) THEORY EXAMINATION 2021-22
SENSORS AND TRANSDUCERS

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

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.
2. Any special paper specific instruction.

SECTION A

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

a. Describe the functioning of LVDT

b. Define piezoelectric sensors

c. How can you say that proximity sensors are indispensable in industrial applications?

d. What are RTDs?

e. Charge Coupled Device: Explain.

f. How Complementary metal-oxide semiconductor type of Imaging sensors work?

g. Which type of ADC is widely used? Why?

h. What is the role of timers in Data Acquisition systems?

i. What is Self-calibration in smart sensors?

j. How smart sensors are Self-testing & self-communicating?

SECTION B

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

a. What are the benefits of Measurement of displacement using Potentiometer? Give a detailed report.
b. Discuss vibration sensors with respect to their methodology of working.
c. Write short notes on advantages of machine vision.
d. Discuss types of amplifiers with respect to their amplification parameter.
e. What are the Strategies for Industrial robots' adaptation in smart sensor applications?

SECTION C

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

(a) Explain measurement of pressure using LVDT based diaphragm & piezoelectric sensor with suitable diagrams.
(b) Measurement of force using strain gauges & load cells. Discuss.

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

(a) What is the necessity of thermal imaging? Explain
(b) Discuss the working principle and applications of Hall Effect Sensors. Can the output from the Hall Effect sensor be in Analog and Digital Form? How?

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

(a) Explore training the vision system in a pick and place robot.

(b) Sensing & digitizing function in machine vision. Give a detailed insight.

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

(a) What are the Functions of signal conditioning equipment? Explain in detail.

(b) Explain the elements of Data Acquisition Systems and Conversion.

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

(a) What are smart sensors? Discuss in detail electric vehicles.

(b) Discuss the development of Smart city using smart sensors.