



PAPER ID-411033

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Subject Code: KEE052

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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.

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