

B.TECH.
(SEM V)THEORY EXAMINATION 2022-23
SENSOR AND INSTRUMENTATION TECHNOLOGIES FOR CIVIL
ENGINEERING APPLICATION

Time: 3 Hours**Total Marks: 100****Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.****2 x 10 = 20**

- (a) What is measurement and instrumentation?
- (b) Write the three types of measuring instruments?
- (c) Why sensors are required?
- (d) How do you mount ultrasonic sensor?
- (e) Why is data reduction needed?
- (f) What is the example of data reduction algorithm?
- (g) What is the use of frequency domain?
- (h) What is frequency domain sampling?
- (i) What is the purpose of signal processing?
- (j) Write the limitations of digital processing.

SECTION B**2. Attempt any three of the following:****10 x 1 = 10**

- (a) What are the applications of sensor in civil Engineering ? Describe
- (b) Describe the present scope of instrumentation in Civil Engineering application.
- (c) What do you understand by the use of sensor in remote sensing and how it is work in field of civil engineering?
- (d) Explain the need for frequency domain analysis.
- (e) Write the basic concept in frequency domain signal processing.

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

- (a) What are the most common sensors? How many types of sensors are there in the world? Describe any one.
- (b) Describe smoke sensor? What are the uses of smoke sensor in field of civil engineering?

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

- (a) What is the smallest change which a sensor can detect termed? What is the output of smart sensor?
- (b) What is the purpose of instrumentation system? What is the importance of instrumentation in civil engineering?

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

- (a) Predict the response of sensors to various input . Explain
- (b) Differentiate between types of sensors and their modes of operation and measurement.

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

10 x 1= 10

- (a) Give the examples of statistical information to calculate the Average value (mean).
- (b) How much each measurement deviates from the mean (standard deviation).

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

10 x 1= 10

- (a) What are frequency domains in Fourier transformation? What does the FFT analysis of a signal?
- (b) How do you find the frequency resolution? How can frequency resolution be improved?

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