Printed Pages: 02 **Sub Code: NEE403**

Paper Id: | 1 | 2 | 0 | 4 | 1 | 1 | **Roll No.** | | | | | | | | | | |

B.TECH
(SEM IV) THEORY EXAMINATION 2017-18
INSTRUMENTATION & PROCESS CONTROL

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**

a. What do you mean by a transducer?

b. What is a process control system?

c. What is the difference between sensor & transducer?

d. Define the LVDT.

e. Define stress & strain.

f. Define the Loading effect.

g. List the advantages of electrical transducers?

h. Describe a method for the measurement of displacement

i. What is Instrumentation system?

j. Classify the Land Line Telemetry?

SECTION B

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

a. Differentiate between the following using suitable example
   1. Transducers and inverse Transducers
   2. Active and Passive Transducers

b. Describe the working of Galvanometer type strip chart recorders. What are the different types of tracing systems used in it? Explain with the help of suitable diagram.

c. Describe the basic components of a magnetic tape recorder for instrumentation applications using Direct Recording techniques.

d. With a neat diagram explain Potentiometric resistance transducer. List its advantage & disadvantages also.

e. Describe the construction, principle of working and any two applications of Hall effect transducers.

SECTION C

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

(a) Describe the working and theory of an Ultrasonic Flow meter. List its advantages and disadvantages.

(b) Describe the different methods for digital tape recording. Explain the advantages and disadvantages.

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

(a) Discuss the various types of angular velocity measurement transducers.

(b) A resistance wire strain gauge with a gauge factor of 2 is bonded to a steel structural member subjected to a stress of 125 MN/m^2. The modulus of Elasticity of steel is 250 GN/m^2. Calculate the % change in the value of the gauge resistance due to the applied stress.

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

(a) Compare resistance Thermometer & Thermistor. Describe the principle and working of a piezo- electric system.

(b) Explain the principle of working of capacitive transducer with the help of suitable diagram. Explain capacitive voltage divider method for level of high conductivity liquid.

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

(a) Explain the working principle of an 'Spectrum Analyzer'. Give its salient features.

(b) Define Time division multiplexing and Frequency division multiplexing as applied to telemetry.

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

(a) What is Data Acquisition System (DAS)? Explain the played by different elements. What do you mean by transmission channels and media.

(b) **Write notes on any two of the following:**

1. PI mode controller
2. Pneumatic controller
3. Electronic controller