

B. TECH
(SEM-V) THEORY EXAMINATION 2018-19
TRANSDUCER AND SENSORS

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. Define the term: Static Sensitivity.
- b. Define the term: Measured Value and True Value.
- c. Draw the Least square Calibration curve.
- d. Explain the loading effects in force measurement.
- e. Explain the principle of digital displacement transducer.
- f. Differentiate Sensors and transducers.
- g. Explain the role of eddy current in a transducer.
- h. Define the working principle of Strain Gauge.
- i. What are the basic elements of an instrument? Explain.
- j. What do you understand by Thermometer? Explain.

SECTION B

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

- a. (i) Differentiate Active and Passive transducers with diagrammatic examples.
(ii) What are thermistor and what physical quantity is precisely measured by them?
- b. Explain the working of Translational Velocity transducer with suitable diagram.
- c. (i) Show how piezoelectric transducers can be used to measure pressure.
(ii) Describe the properties of materials used for piezoelectric transducers. Derive expression for voltage sensitivity.
- d. Describe the Turbine Flow Meter with its limitations and advantages.
- e. Explain the working of Translational Velocity transducer with suitable diagram.

SECTION C

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

- (a) Explain the parameters hysteresis, dead band, back lash and drift with the relation to instruments.
- (b) (i) Draw and explain the block diagram of measurement system. Also explain its various characteristics.
(ii) Explain the operating principle of inductive method for liquid level measurement

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

- (a) Explain the arrangement of variable inductance transducer.
- (b) Describe the Tachometer encoder methods. Explain the eddy current drag cup tachometer with help of suitable diagram.

5. Attempt any *one* part of the following: 10 x 1 = 10
- (a) How many methods are used for force measurement? Explain any one method with suitable diagram in detail.
 - (b) Write short note on:
 - (i) RTD
 - (ii) Torque measurement on rotating shafts.
6. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain the Eddy current drag cup rotational velocity measurement with suitable diagram.
 - (b) Discuss about the working principle of:
 - (i) Hot Film Shock tube velocity sensor.
 - (ii) Ultrasonic method of liquid level measurement.
7. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Discuss about the working of Flour Optic temperature measurement system in detail.
 - (b) Explain the working of monochromatic brightness radiation thermometers with suitable diagram.

