

**(Compulsory Question)**

9. (a) The indirect measurements involving one translation are called.....measurements and those involving two translations are called.....measurements.
- (b) What are sources of error ?
- (c) Explain pneumatic load cells.
- (d) What are the applications of strain gauges ?
- (e) Define gauge factor.
- (f) Write a short note on bimetallic thermometer.
- (g) List parts of hot wire anemometer.
- (h) What are the differences in tachometer and stroboscope ?
- (i) What is Servo Mechanism ?
- (j) Give *two* examples of open control systems.

**1½×10=15**

Roll No. ....

Total Pages : 04

**J-21-0062**

**B. Tech. EXAMINATION, 2021**

Semester VI (CBCS)

MEASUREMENT AND CONTROL

ME-602

*Time : 2 Hours*

*Maximum Marks : 60*

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*The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.*

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**Note :** Attempt *Four* questions in all, selecting *one* question from any of the Sections A, B, C and D. Q. No. **9** is compulsory.

**Section A**

1. Explain with the help of block diagram a generalized measurement system and identify the various elements and point out the function performed by each element.

**15**

2. Explain the following terms as related to dynamic characteristics of an instrument :
- Speed of response and measuring lag
  - Fidelity and Dynamic error
  - Dead time and Dead zone
  - Step, ramp and linear input functions. **15**

### Section B

3. List the advantages and disadvantages of capacitive transducers A capacitive transducer is made up of two concentric cylindrical electrodes which are 20 mm in length. The outer diameter of the inner electrode is .5 mm and a gap of 0.1 mm between the electrode contains air as the dielectric medium. Find out the change in capacitance when the inner movable electrode is shifted through a distance of 1.5 mm. **15**
4. What is temperature compensation and how is it achieved when using bonded strain gauge for the measurement of axial thrust, bending loads and torque ? **15**

### Section C

5. State the objectives of flow visualisation. Explain some of the methods commonly adopted for flow visualisation in low speed flows. **15**
6. Describe briefly the methods used for calibrating temperature measuring devices exclusive of radiation and optical pyrometers. **15**

### Section D

7. What does Dynamometer measure ? How is dynamometer classified ? Explain the construction and working of Prony brake dynamometer with its applications. **15**
8. Shrink the multiple loop control system that illustrated as shown in Figure to a single block diagram and determine the overall transfer between the referred input  $R(s)$  and the controlled output  $C(s)$ . **15**

