

Code No.: ME405PC

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**CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS**

**II-B.TECH-II-Semester End Examinations (Supply) - February- 2023
INSTRUMENTATION AND CONTROL SYSTEMS
(MECH)**

[Time: 3 Hours]

[Max. Marks: 70]

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 20 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A

(20 Marks)

1. a) Describe with an example, the applications of measurement systems. [2M]
- b) List the different sources of errors. [2M]
- c) Write the advantages of thermocouples. [2M]
- d) Discuss the salient features of resistance thermometers. [2M]
- e) Discuss the advantages and disadvantages of Ultrasonic flow meters? [2M]
- f) What are the different factors which influence the choice of method used for measurement of flow? [2M]
- g) List some practical situations where strain measurement becomes essential. [2M]
- h) Define the gauge factor of a resistance strain gauge. [2M]
- i) Write the classification of control systems. [2M]
- j) Discuss the main applications of servomotors. [2M]

PART-B

(50 Marks)

2. Explain how displacement can be measured with the help of an inductive transducer and a capacitive transducer. Give the essential features of construction of these two types of electrical transducers. [10M]

OR

3. Discuss the theory and construction of piezoelectric transducers. [10M]
4. What is a thermistor? Explain the construction and working of a thermistor with a neat sketch. [10M]

OR

5. Describe the construction, working and theory of McLeod gauge for measurement of vacuum. List its advantages and disadvantages. [10M]
6. Describe with neat sketches, the construction and working principle of a rotameter. [10M]

OR

7. Explain in detail the construction and working of Non-contact type Stroboscope. [10M]
8. What do you mean by resistance strain gauges? Give a detailed discussion on the subject covering the basic principle, gauge and binding materials, and application of the method. [10M]

OR

9. Explain, in detail the working of Delta type strain gauge rosettes [10M]
10. Illustrate with example, explain Closed loop temperature control system. [10M]

OR

11. Explain the working of a servo-controlled dynamometer which automatically adjusts the speed and torque of the engine of the automobile to the desired values. [10M]
