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Code No: 136SE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2019

MECHANICAL MEASUREMENTS AND CONTROL SYSTEMS

(Mechanical Engineering - Mechatronics)

Time: 3 hours

Max. Marks: 75

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

Part A is compulsory which carries 25 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

(25 Marks)

- 1.a) Comment about zero drift associated with measuring instrument. [2]
- b) Explain the working principle of pyrometer. [3]
- c) What are the limitations of bellows used for pressure measurement? [2]
- d) Differentiate between direct and indirect methods of level measurement [3]
- e) What are the limitations of strain gauges? [2]
- f) What are the applications of strain gauge rosettes? [3]
- g) Define humidity. [2]
- h) Give the limitations of torsionmeters. [3]
- i) Give the definition of process in a control system. [2]
- j) Give the classification of control systems. [3]

PART - B

(50 Marks)

2. Considering hot-wire anemometer as an example give the generalized configuration and functional description of the elements. [10]

OR

- 3.a) Comment about the linearity of measuring instruments.
- b) Explain the functioning of thermocouples. [5+5]
- 4.a) Explain the use of diaphragm gauges for pressure measurement.
- b) With the help of line diagram explain the working of ultrasonic flow meter. [5+5]

OR

5. With the help of a suitable sketch explain the principle, construction, working and applications of bubbler level indicator. [10]

- 6.a) Compare and contrast contact and non-contact type tachometers.
- b) Explain the working of Seismic instruments. [5+5]

OR

7. Explain the basic principle of working of electrical strain gauge. Also, explain how they can be used for measuring different types of strains. [10]

8. With the help of a line diagram explain the construction, working and advantages of absorption psychrometer. [10]

OR

9. What are dynamometers? Explain their construction, working and applications. [10]

10.a) Explain how a closed loop control system is advantageous over an open loop control system.

b) Explain the working of a servomechanism. [5+5]

OR

11. With the help of a block diagram explain how temperature control system works. [10]

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