

R13

Code No: 117EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November/December - 2017

INSTRUMENTATION AND CONTROL SYSTEMS

(Common to AME, ME)

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) Define Resolution and Threshold. [2]
- b) How errors are classified? Enumerate the various sources of errors. [3]
- c) State the difference between thermometer and thermistor. [2]
- d) Describe the constructional details and application of different types of Diaphragm pressure gauges. [3]
- e) State the principle of capacitive level indicator. [2]
- f) What is a turbine flow meter? [3]
- g) Define absolute humidity. [2]
- h) Explain strain gauge rosettes. [3]
- i) What is a servo mechanism? [2]
- j) Differentiate Open and closed loop control systems with a suitable examples. [3]

PART-B

(50 Marks)

2. Explain the following terms:
 - a) Range and span
 - b) Resolution
 - c) Calibration
 - d) Sensitivity.[10]
 3. Sketch and explain with a block diagram generalized measurement system and its elements with an example. [10]
 4. State law of thermocouples. How are the laws useful in construction of thermocouple thermometers? [10]
- OR
5. Discuss the application areas in which low pressures are maintained. List out various indirect methods for measurement of low pressure and explain any two methods. [10]
 6. A Stroboscope projects 6000 flashes per minute on a disk mounted on the shaft of a machine. Find the speed of the machine if the disk appears stationary and has a single image of 10 points. [10]

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OR

- 7.a) Explain the working of mechanical tachometer with a neat sketch.
b) State the difference between vibrometer and accelerometer. [8+2]

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8. Describe the functioning of a stroboscope and explain how speed of a rotating shaft can be measured using a single pattern and multi-pattern disc. [10]

OR

9. How does a mechanical load cell work? Explain the principle of measuring shaft torque using strain gauge torsion meter. [10]

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10. Draw a block diagram of closed loop control system. Describe its working for motor speed control. [10]

OR

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11. What is a block diagram? Explain the steps involved in the preparation of block diagrams. [10]

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