R13

Code No: 117EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, March - 2017
INSTRUMENTATION AND CONTROL SYSTEMS
(Common to ME, AME)

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) What is the role of manipulation elements of measuring elements. [2]
b) Give the classification of errors found in measures instruments. [3]
c) Give the classification of measurement of pressure. [2]
d) Explain the working principle of manometers [3]
e) Explain the Working principle of Seismic instruments. [2]
f) Explain the principle of operation of hot wire anemometer. [3]
g) Explain the functions of strain gauge rosettes. [2]
h) Explain the measurement of power using elastic force meters. [3]
i) What are the requirements of a control system? [2]
j) What are the basic elements of a control system? Explain [3]

Part-B (50 Marks)

2.a) Classify measuring instruments.
b) What are desired, modifying and interfering inputs for a measurement system? Give examples each of these quantities. [5+5]

OR

3.a) What are the different sources of errors in measurements and measuring instruments? Explain them in brief.
b) Describe the terms Linearity, Repeatability and calibration. [5+5]

4. Write a short note measurement of pressure by the following gauges
a) Thermal conductivity gauges
b) Mcleod pressure gauge. [5+5]

OR

5.a) Compare and contrast the advantages and limitations of resistance thermometers and thermistors.
b) Describe the construction and working of Ionization pressure gauges for measurement of pressure. [5+5]

6.a) Describe the construction of bubbler level indicator.
b) Explain the working principle of ultrasonic flow meter. [5+5]

OR

7.a) Discuss in detail about electrical tachometers.
b) What are the mechanical methods to measure the vibrations explain with neat sketches. [5+5]

8.a) What is the temperature compensation with respect to strain gauges?
b) List the essential characteristics required for the backing material of a bonded strain gauge. [5+5]

OR

9.a) Explain with neat sketch the principle of sling psychrometer.
b) Discuss in detail with neat sketch the working principle of torsion meters. [5+5]

10.a) Explain the advantages of open loop control system.
b) Discuss about speed control systems. [5+5]

OR

11.a) What is a servomechanism? Describe the feature of servomechanism.
b) What is a block diagram? Explain the steps involved in the preparation of block diagrams. [5+5]

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