Code No: 126BF **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech III Year II Semester Examinations, May - 2016
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)	Explain the role of sensing element of a measuring instrument.	[2]
b)	What are uses of calibration?	[3]
c)	Give the classification of level measuring instruments.	[2]
d)	What are the advantages of using ultrasonic instrument for flow measurement?	[3]
e)	What are the advantages of mechanical tachometers over electrical tachometers?	[2]
f)	What is the working principle of seismic instrument?	[3]
g)	List out the advantages of absorption psychrometer.	[2]
h)	Explain the working principle of load cell.	[3]
i)	What is the importance of control systems?	[2]
j)	What is a servomechanism? Explain.	[3]

PART - B

(50 Marks)

2. Considering the example of a pyrometer give the functional description of various elements. [10]

OR

3.a) Give the complete classification of various transducers used for displacement measurement and give their working applications.
b) Explain the use of the principle of expansion for the measurement of pressure. [5+5]

4. Describe the construction and explain the working of bourdon tube used for pressure measurement. [10]

OR

5. Explain the construction, working, applications and limitations of laser Doppler anemometer. [10]

6. Derive an equation for the gauge factor of electrical strain gauge. [10]

OR

7.a) Describe a electrical tachometer and explain its working.
b) Explain the use of resistance strain gauge for the measurement of torque. [5+5]

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

OR

9. Give the complete classification of torsionmeters. Explain the construction and working of torsionmeters used for torque measurement. [10]

10.a) Explain the advantages and limitations of block diagrams for control system.

b) Comment about the use of closed loop control systems in the presence of errors. [5+5]

OR

11. With the help of line diagram explain the working of speed control system. [10]

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