Code No: 137DN **R16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, July/August - 2023
INSTRUMENTATION AND CONTROL SYSTEMS
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Distinguish between accuracy and precision.	[2]
b)	Compare active and passive transducers.	[3]
c)	Give various forms of thermistors.	[2]
d)	Explain the operating principle of manometers in measurement of pressures.	[3]
e)	List out the various flow meters.	[2]
f)	Give the classification of Tachometers?	[3]
g)	What are the limitations of elastic force meters?	[2]
h)	What is bubble level indicator?	[3]
i)	What are the requirements of a control system?	[2]
j)	What is the difference between open loop and closed loop system?	[3]

PART – B

(50 Marks)

2.a) Sketch the block diagram of generalized measurement system and explain function of each element.
b) Explain briefly the dynamic characteristics of measuring instruments. [5+5]

OR

3.a) Explain the principle and working of capacitive transducer for displacement measurement.
b) What are the different sources of errors in measurements and measurement instruments? Explain them. [5+5]

4.a) Explain bimetallic thermometers with applications.
b) Explain the working of optical pyrometer. [5+5]

OR

5.a) Explain with a neat sketch the principle of working of manometer.
b) Explain the working of McLeaod pressure gauge used for measuring vacuum pressure. [5+5]

6.a) Explain about capacitive liquid level indicators.
b) Explain the working of turbine meter with neat sketch. [5+5]

OR

7.a) Explain the working mechanical tachometer with a neat sketch.
b) Explain the working principle involved in seismic instrument. [5+5]

8.a) Explain the method of calibration of strain gauges.

b) Explain the bridge circuit along with an operational amplifier for measurement of strain. [5+5]

OR

9.a) Explain the working principle of Dynamometer type wattmeter for measurement of Power.

b) Describe the working and sling psychrometer used to study the properties of moist air. [5+5]

10.a) Discuss the importance of control systems.

b) Explain the working of position control system. [5+5]

OR

11. Explain how temperature can be measured by using a closed loop with a block diagram. What are the different units present in the block diagram and explain the functions of each unit. [10]

---ooOoo---