



B.Tech V Semester Regular/Supplementary Examinations, February 2024
INSTRUMENTATION AND CONTROL SYSTEMS
 (Mechanical Engineering)

Maximum Marks: 70

Date: 24.02.2024 Duration: 3 hours

- Note:**
1. This question paper contains two parts A and B.
 2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
 3. Part B consists of 5 Units. Answer any one full question from each unit.
 4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A		CO	Bloom Tx
All the following questions carry equal marks (10x2M=20 Marks)			
1	Mention the basic requirements of measurement.	1	L2
2	Why calibration of instrument is important?	1	L2
3	State the characteristics of manometer fluid	2	L2
4	Classify the temperature measuring devices?	2	L2
5	Differentiate between direct and indirect methods of level measurement?	3	L3
6	List out the applications of Stroboscope?	3	L2
7	What is Strain gauge Rosettes.	4	L2
8	What are the devices used for measuring humidity?	4	L2
9	Give the examples of open loop system?	5	L3
10	Explain the closed loop system.	5	L1
Part-B			Bloom Tx level
Answer All the following questions. (5X10M=50Marks)			
11	a) Explain the standards of measurement. [5M]	1	L2
	b) For the given data, calculate: [5M] 1. Arithmetic mean, 2. Deviation of each value, 3. Algebraic sum of the deviation. $X_1=49.7, X_2=50.2, X_3=49.6, X_4=49.7$	1	L3
OR			
12	a) Describe the calibration of the measurement system. [5M]	1	L1
	b) Write about the dynamic characteristics of an instrument. [5M]	1	L2
13	Explain with neat sketch construction and working principle of LVDT. List its advantages and disadvantages? [10M]	2	L3
OR			
14	a) What is RTD? Explain in detail about working principle of RTD with a neat sketch. [5M]	2	L3
	b) Explain the Mcleod vacuum gauges used for pressure measurement and its limitations? [5M]	2	L3
15	Discuss briefly with neat diagrams the following methods of liquid level Measurement: (a) Ultrasonic level measuring gauge (b) Capacitive type with Variable Dielectric constant. [10M]	3	L2
OR			

16	a) 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. [5M] b) 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. [5M]	3	L4 L4
17	a) Explain with neat sketch the principle of sling psychrometer? [5M] b) Discuss in detail with neat sketch the working principle of torsion meters. [5M]	4	L3 L4
OR			
18	a) What is the temperature compensation with respect to strain gauges? [5M] b) List the essential characteristics required for the backing material of a bonded strain gauge? [5M]	4	L3 L2
19	a) Explain the steps involved in the closed and open loop systems block diagram. [5M] b) Differentiate between open loop and closed loop control system? [5M]	5	L2 L3
OR			
20	What is a servomechanism? Describe the features of servomechanism? [10M]	5	L3