K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:VI
Class:TY	Program:B.Tech
Branch Code:CHE	Pattern:2022
Name of Course:Process Instrumentation	Course Code:CHE223017
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcomes.

		Marks	CO
Question No. 1			
1a)	What are transducers? Write a note on active and passive transducers with necessary examples.	(6)	CO1
Question No. 2			
2a)	Explain how the reference junction affects thermocouple measurement accuracy.	(6)	CO2
Question No. 3			
3a)	Explain the different pressure scales used in industry: absolute, gauge, vacuum, and differential pressure.	(8)	CO3
	OR		
3b)	Analyze how the geometry and material of a Bourdon tube influence its pressure-sensing behavior and measurement accuracy.	(8)	CO3
3c)	Discuss the working principle of high-pressure sensors such as dead weight and strain gauge.	(8)	CO3
	OR		
3d)	What is a capacitive pressure sensor? Describe its operating principle and applications.	(8)	CO3
Question No. 4			
4a)	Compare *ultrasonic* level sensors with *weighing* type sensors for bulk solid applications.	(8)	CO4
	OR		
4b)	Describe the design and working of a Venturimeter. Why is it more accurate than an orifice meter?	(8)	CO4
4c)	Differentiate between Rotameter, orifice and piston-type flow meters.	(8)	CO4
	OR		
4d)	Explain the principle of electrical capacitance-type level measurement. How is capacitance related to level variation?	(8)	CO4
Question No. 5			

5a)	Explain the classification of analytical instruments based on measurement principles. Draw and discuss the basic components of an analytical instrument, highlighting the role of each block in ensuring accurate analysis.	(8)	CO5

OR

5b)	Explain the principle of chromatography and its significance in separation science.	(8)	CO5
5c)	Differentiate between scanning electron microscopy (SEM) and transmission electron microscopy (TEM).	(8)	CO5

OR

5d)	Compare gas chromatography (GC) and liquid chromatography (LC) in terms of mobile phase, applications, and limitations.	(8)	CO5

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