

Name:

Enrolment No:



UPES

End Semester Examination, May 2023

Program Name : M Tech Chemical Engineering

Semester : II

Course Name : Advanced Industrial Instrumentation

Time : 3 hours

Course Code : CHPA7005P

Max. Marks : 100

Nos. of page(s) : 01

Instructions : Assume any missing data. Draw the diagrams, wherever necessary. Write roll number and name on any additional sheet that you use.

SECTION A  
(5QX4M=20 marks)

S. No.		Marks	CO
1	Recall the need of mathematical modeling of process?	4	CO1
2	Define interacting system and give an example.	4	CO3
3	What is the basic principle of Hygrometer.	4	CO2
4	Name different types of viscometer?	4	CO1
5	List the advantages of using venturi tube as a restriction element?	4	CO2

SECTION B  
(4QX10M=40 marks)

6	Elaborate the optical instruments used in the measurement of Temperature.	10	CO2
7	Elaborate the principles of measurement in liquid level.	10	CO2
8	Relate open and closed loop systems.	10	CO3
9	Interpret flow control actuators with pneumatic and hydraulic movement	10	CO3

SECTION C  
(2QX 20M=40 marks)

10	Identify various types of level detectors with appropriate principles and diagrams. OR Classify the instruments used to measure the humidity and explain each of the instrument briefly.	20	CO2
11	Sketch pneumatic actuator for the control of heat exchanger. If this process is a first order system where the actuator has no dynamic lag, develop a block diagram for the entire system with a PID controller and write down the transfer function of the entire process.	20	CO3