TED (21) 4083
(Revision – 2021)

A23-2103230142A

Reg. No……
Signature …….

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/ MANAGEMENT/COMMERCIAL PRACTICE, APRIL – 2023

PROCESS CONTROLL INSTRUMENTATION

[Maximum Marks: **75**] [Time: **3** Hours]

PART-A

I. Answer *all* the following questions in one word or one sentence. Each question carries *'one'* mark.

(9 x 1 = 9 Marks)

		Module Outcome	Cognitive level
1.	Define process.	M1.01	R
2.	If 'r' is the set point and 'b' is the controlled variable, then the expression of error is.....	M1.02	R
3.	List any two elements of process control loop.	M1.02	R
4.	Give the equation for two position control mode.	M2.02	R
5.	Write the equation for PID controller.	M2.03	R
6.	Define Rangeability of Control Valve.	M3.03	R
7.	Name any two auxiliary units for control valve.	M3.04	U
8.	Define the term 'telemetry'.	M4.02	U
9.	What is the full form of HART?	M4.04	R

PART-B

II. Answer any *eight* questions from the following. Each question carries *'three'* marks.

(8 x 3 = 24 Marks)

		Module Outcome	Cognitive level
1.	Draw the block diagram of process control.	M1.01	U
2.	Illustrate the concept of self regulation in process control.	M1.03	U
3.	Give the output equation of three position control Mode.	M2.02	U
4.	Illustrate offset error with a figure.	M2.03	U
5.	Draw the PID controller using Op –amp.	M2.03	R
6.	Differentiate between air to open and air to close control valves.	M3.03	U
7.	Draw the inherent flow characteristics of control valve.	M3.03	U
8.	What are the elements of final control operation?	M3.01	U
9.	Illustrate the role of alarms in process control with an example.	M4.01	A
10.	What are the benefits of using HART communication protocol?	M4.04	R

PART-C

Answer all questions. Each question carries *'seven'* marks

(6 x 7 = 42 Marks)

		Module Outcome	Cognitive level
III.	Explain a Temperature process control system and identify process parameters.	M1.04	U
	OR		
IV.	Explain a Pressure process control system and identify process parameters.	M1.04	U
V.	Explain the difference between Human aided control and Automatic control with an example.	M1.01	U
	OR		
VI.	Describe the Level process control system.	M1.04	U
VII.	Explain the PI control mode with electronic implementation.	M2.03	U
	OR		
VIII.	Illustrate the Ziegler Nichols method of tuning a controller.	M2.04	A
IX.	Explain the working of pneumatic actuator.	M3.02	U
	OR		
X.	Explain the working of Butterfly valve.	M3.03	U
XI.	Describe the control valve Cavitation and flashing.	M3.03	U
	OR		
XII.	Explain any three auxiliary units for control valve.	M3.04	U
XIII.	What is the function of an annunciator? A sensor measures temperature as 360 μV /°C. Develop an alarm circuit that alerts when temperature reaches 530 °C.	M4.01	A
	OR		
XIV.	Draw and explain the motion balance telemetry system.	M4.02	U

****