

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2022****Subject Code:3151709****Date:13-01-2023****Subject Name:Process Instrumentation****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) Enlist control valve accessories.	03
(b) Draw ISA Symbol of the following: (i) Pressure relief valve (ii) Damper (iii) Ball Valve (iv) Safety valve (v) Relief Valve (vi) Actuator (vii) Target Flow Meter (viii) Plug Valve	04
(c) Explain control valve characteristics in detail with necessary diagram.	07
Q.2 (a) Discuss in brief design layout for control room panel with suitable diagram.	03
(b) Explain the Electrical power system requirement for control room.	04
(c) Classify control panels. Explain Break Front Panel with neat diagram.	07
OR	
(c) Classify compressors and explain any one type in detail with neat diagram.	07
Q.3 (a) Why is it necessary to give tag number to field instruments? Give the general guidelines one have to follow while assigning the tag no to any field instrument.	03
(b) Explain butterfly valve in detail.	04
(c) Explain pneumatic transmitters in detail.	07
OR	
Q.3 (a) Describe difference between 2 wire and 4 wire transmitter.	03
(b) Enlist different valve noise problems. Discuss in brief about cavitation.	04
(c) Brief about pressure relieving devices. Discuss Safety Valves in detail.	07
Q.4 (a) Discuss rupture disc in detail.	03
(b) Explain desiccant type dryer with suitable diagram.	04
(c) List different types of Actuators. Discuss Pneumatic Actuator with neat diagram.	07
OR	
Q.4 (a) Differentiate between single port & double port design of globe valve.	03
(b) Explain any one non lubricant compressor in detail.	04
(c) What is valve coefficient (Cv)? Explain importance of control valve in process control. Define relation of valve co-efficient to size the capacity of control valve.	07
Q.5 (a) Explain frequency to voltage converter with suitable diagram.	03
(b) Discuss about Smart Transmitter, its features, advantages and disadvantages.	04

- (c) Define recorder. Explain types of recorder with neat diagram. Enlist merit and demerits of recorders. **07**

OR

- Q.5** (a) Discuss Annunciator Sequence in detail. **03**
(b) Explain Electric to Pneumatic (I-P) Converter with suitable diagram. **04**
(c) Enlist criteria to be taken care while designing a good quality instrument air system. Explain different factors related to distribution of Instrument air. **07**
