

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VII EXAMINATION – SUMMER 2026

Subject Code:3171718

Date:20-05-2026

Subject Name:Power Plant Instrumentation

Time:02:30 PM TO 05:00 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) Draw the ISA symbols for following three devices to draw P&I diagram. (1) Square root Flow signal (2) Final Control element (3) DP transmitter with flow transmitter	03
	(b) Draw the basic block diagram of a nuclear power plant. And list out the primary components of nuclear reactor.	04
	(c) Draw the general layout of typical thermal power plant. Write the name of subdivision or smaller units of main power plant.	07
Q.2	(a) Find out the highest speed for a steam turbo alternator with 2 poles and 50 Hz frequency.	03
	(b) Give the importance of measuring Oxygen in flue gas?	04
	(c) Draw the schematic for DP transmitter for steam flow measurement with installation diagram and required correction.	07
	OR	
	(c) Explain the function of following elements of thermal power plant (1)Economiser (2) Steam Turbine (3) Cooling Tower	07
Q.3	(a) Name three different drafts in connection with boiler.	03
	(b) Describe the vibration measurement in turbine.	04
	(c) With proper diagram and explanation write how three element boiler control is superior to single and two element boiler control.?	07
	OR	
Q.3	(a) Enlist the principal parts of turbine.	03
	(b) Draw schematic for Feed water and steam flow circuit.	04
	(c) Which and how the different measurements carried out to find out the amount of impurities in water and steam in thermal power plant.	07
Q.4	(a) What is Theoretical air requirement for combustion?	03
	(b) Calculate the overall efficiency of steam thermal power plant if boiler efficiency 85%, turbine efficiency 30% and generator efficiency of 92% is given.	04
	(c) Explain all the external treatments given to feed water purification.	07
	OR	
Q.4	(a) Write the objectives of Instrumentation and Control of a power plant.	03
	(b) Explain the working for Dissolved Oxygen Analyzer.	04

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| | (c) | Explain water side steam temperature control method. | 07 |
| Q.5 | (a) | Which different analysis required in power plant for safety and environmental control? | 03 |
| | (b) | Explain about safety and safety related systems in nuclear power plant. | 04 |
| | (c) | Draw the layout of hydroelectric power plant and explain each part in brief. | 07 |
| | | OR | |
| Q.5 | (a) | Explain instrumentation in hydroelectric power plant. | 03 |
| | (b) | Draw schematic for Air-Flue gas circuit. | 04 |
| | (c) | Discuss the primary components of nuclear reactor. | 07 |
