

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII EXAMINATION – SUMMER 2025

Subject Code:3171718

Date:08-05-2025

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) Differentiate between conventional and non conventional sources of energy based on Environmental point of view and Availability | 03 |
| (b) Define the objectives of Instrumentation and Control in Power Plant operations. | 04 |
| (c) Describe two nuclear reactions by which nuclear energy is generated? | 07 |

- Q.2**
- | | |
|--|-----------|
| (a) Give the importance of measuring Oxygen in flue gas? | 03 |
| (b) Draw only layout of a typical thermal power plant. | 04 |
| (c) Explain the function of following elements of thermal power plant (1) Condenser (2) Super heater (3) Cooling Tower | 07 |

OR

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|--|-----------|
| (c) Explain the function of following elements of thermal power plant (1)Economiser (2) Steam Turbine (3) Alternator and its speed control | 07 |
|--|-----------|

- Q.3**
- | | |
|---|-----------|
| (a) Give classification of turbines | 03 |
| (b) Draw the schematic for DP transmitter for steam flow measurement with installation diagram and required correction. | 04 |
| (c) Describe the speed and vibration measurement in turbine. | 07 |

OR

- Q.3**
- | | |
|--|-----------|
| (a) Enlist the principal parts of turbine. | 03 |
| (b) Draw schematic for Feed water and steam flow circuit. | 04 |
| (c) Explain about lubrication for turbo-alternator and turbine steam inlet system. | 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 three element level control of boiler water. | 07 |

OR

- Q.4**
- | | |
|---|-----------|
| (a) What is blow down and why it is needed? | 03 |
|---|-----------|

- | | | | |
|------------|-----|--|----|
| | (b) | Which bad effects can be generated in boiler due to feed water impurities. | 04 |
| | (c) | Explain water side steam temperature control method. | 07 |
| Q.5 | (a) | Explain instrumentation in hydroelectric power plant. | 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) | Write various approaches for protection of explosion to ensure safety. | 03 |
| | (b) | Explain the working of PWR reactor in nuclear power plant. | 04 |
| | (c) | Write the parameters for selection of hydroelectric plants. Classify the hydroelectric plants. | 07 |
