Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171910 Date:12-12-2023

Subject Name: Power Plant Engineering

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.**

Q.1	**(a)**	Explain the present power position in India.	**03**
	(b)	Draw general layout of modern steam power plant and label all major components.	**04**
	(c)	Explain pressurized FBC boiler with neat sketch.	**07**
Q.2	**(a)**	List requirements of a good ash handling plant.	**03**
	(b)	Explain the principle of fluidized bed combustion.	**04**
	(c)	What do you understand by "Boiler Draught"? How the draughts are classified?	**07**
		OR	
	(c)	Explain cyclone burner with neat diagram.	**07**
Q.3	**(a)**	What are the major zones in the boiler?	**03**
	(b)	Explain different types of nozzles with neat sketch.	**04**
	(c)	Derive an expression for mass flow rate of steam through the nozzle.	**07**
		OR	
Q.3	**(a)**	How the turbines are classified according to direction of steam flow?	**03**
	(b)	Explain compounding of steam turbines.	**04**
	(c)	Derive equation of maximum discharge through a nozzle or critical pressure ratio.	**07**
Q.4	**(a)**	Give classification of condensers.	**03**
	(b)	Explain Wind Energy Conversion System.	**04**
	(c)	Explain hydro-electric power plant drawing general layout.	**07**
		OR	
Q.4	**(a)**	Discuss Chain Reaction in Nuclear Power plant.	**03**
	(b)	Explain working of closed cycle gas turbine with neat sketch.	**04**
	(c)	Explain working of combined cycle plant with neat sketch.	**07**
Q.5	**(a)**	Differentiate between nuclear fusion and fission.	**03**
	(b)	What is the need of cooling gas turbine blades? Explain transpiration cooling of gas turbine blades.	**04**

	(c)	What do you understand by the term tariff? State the various methods for calculation of tariff of them.	**07**

OR

Q.5	**(a)**	Define: Demand Factor, Diversity Factor and Plant Capacity Factor	**03**
	(b)	Explain working principle of solar cell.	**04**
	(c)	Explain with neat sketch construction and working of CANDU type reactor.	**07**

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