Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – SUMMER 2022

Subject Code:3171910 Date:01/06/2022

Subject Name:Power plant Engineering

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)**	Enlist main components of thermal power plant.	**03**
	(b)	Draw neat sketch of La-Mont boiler.	**04**
	(c)	Discuss with flow diagram various stages in coal handling system.	**07**
Q.2	**(a)**	Give classification of draught.	**03**
	(b)	Explain principle operation of steam turbine.	**04**
	(c)	Comparison between forced draught and induced draught.	**07**
		OR	
	(c)	Prove that velocity of steam flowing through nozzle is $C_2 = 44.72\sqrt{h_1 - h_2}\ m/s$	**07**
Q.3	**(a)**	Define the following terms related to condenser. (1) vacuum efficiency (2) condenser efficiency	**03**
	(b)	What is blow down? Why it is needed?	**04**
	(c)	Prove that optimum pressure ratio for maximum work output in actual cycle is $r_p = \left[\frac{T_3}{T_1}\right]^{\frac{\gamma}{2(\gamma-1)}}$	**07**
		OR	
Q.3	**(a)**	Write advantages and disadvantages of gas turbine over steam turbine plants	**03**
	(b)	Explain with neat sketch the blade cooling of gas turbine.	**04**
	(c)	Explain effect of operating variables on work ratio.	**07**
Q.4	**(a)**	With neat sketch list components of Nuclear Reactor.	**03**
	(b)	Discuss various factors to be considered while site selection of nuclear power plant.	**04**
	(c)	What is Nuclear waste? How it can be disposed? Give diagram of nuclear life cycle.	**07**
		OR	
Q.4	**(a)**	What is Nuclear fusion and fission?	**03**
	(b)	Explain throttle governing of steam turbine.	**04**
	(c)	With neat sketch explain Can type combustor with swirl flow flame stabilizer	**07**
Q.5	**(a)**	Explain briefly following terms: (1) Load curve (2) Load duration curve.	**03**

(b) The following loads are connected to a power plant : **04**

Types of load	*Max demand MW)*	*Diversity factor*	*Demand factor*
Domestic	*20*	*1.23*	*0.70*
Commercial	*30*	*1.20*	*0.88*
Industrial	*60*	*1.30*	*0.97*

If the overall diversity factor is 1.45, determine (i) the maximum load (ii) the connected load of each type.

(c) Explain wind power generator with schematic diagram. **07**

OR

Q.5 **(a)** What is the significance of two part tariff and three part tariff? **03**

(b) Define the following terms: (1) Peak Load (2) Average Load (3) Plant capacity factor (4) Connected Load **04**

(c) What is concentrating solar-thermal power (CSP) technology and how does it work? Explain with line diagram. **07**

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