GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER– V(OLD) EXAMINATION – SUMMER 2019

Subject Code:151904   **Date:20/06/2019**
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.**

Q.1	**(a)**	Draw general layout of modern thermal power plant and label major components. Explain its main four circuits in brief.	**07**
	(b)	Draw a neat sketch of Velox boiler. What are its advantages over conventional high pressure boilers?	**07**
Q.2	**(a)**	What are the advantages and Disadvantages of Pulverized coal firing.	**07**
	(b)	Explain the constructional difference between Low pressure and High pressure boiler.	**07**
		OR	
	(b)	Explain the working of Electrostatic precipitator with neat sketch.	**07**
Q.3	**(a)**	Compare mechanical draught cooling tower with natural cooling tower.	**07**
	(b)	Explain with neat sketch Diesel power plant. Explain function of each system in brief.	**07**
		OR	
Q.3	**(a)**	Explain working of PWR reactor with neat sketch.	**07**
	(b)	A Power plant has following annul factor:	**07**

Load factor = 0.75   Capacity factor = 0.60   Maximum demand is = 60 MW
Estimate : (a) The annual Energy production
(b) The reserve capacity over and above the peak Load
(c) The hours during which the plant not in Service

Q.4	**(a)**	How steam power plant pollute air? What are the effects of this pollution on human health?	**07**
	(b)	Exhaust steam having a quality of 0.95 enter a surface condenser at an absolute pressure of 0.14 bar and comes outs as a water at 45^0 C. The circulating water enters at 30^0 C and leaves at 40^0 C. Estimate quantity of circulating water and condenser efficiency.	**07**
		OR	
Q.4	**(a)**	Explain in detail sodium zeolite water treatment with neat sketch .	**07**
	(b)	The peak load on a 52 MW power station is 40 MW. It supplies power through four transformers whose connected loads are 17, 12, 9 and 10 MW. The maximum demands on these transformers are 15, 10, 8, and 9 MW respectively. if the annual load factor is 52% and plant is operating for 63% of the period in a year, find out the following: (i) Average load on the station (ii) Energy supplied per year (iii) Demand factor (iv) Diversity factor (v) Power Station use load.	**07**
Q.5	**(a)**	Derive expression for chimney height in terms of air and flue gas temperature and air-fuel ratio.	**07**
	(b)	Explain working of two pass flow surface condenser with neat sketch	**07**
		OR	
Q.5	**(a)**	Classify the diesel engine lubrication system. Explain any one with neat sketch.	**07**
	(b)	A draught of 20mm of water column each produce in 33m high chimney. The air and flue gas temperatures are 310K and 670K. Coal used is 2500Kg/hour. Find (1) quantity of air supplied per Kg of coal (2) The draught in terms of column of hot gases.	**07**

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