Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– V(OLD) EXAMINATION – SUMMER 2019

Subject Code:151906 **Date:10/06/2019**

Subject Name:Conventional Power 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 the neat sketch of Layout of steam power plant. Explain the main circuits of steam power plant.	**07**
	(b)	Describe with a neat sketch the construction and working of a Francis turbine.	**07**
Q.2	**(a)**	Derive the equation of efficiency of Ideal Brayton cycle of gas turbine.	**07**
	(b)	Explain the different factors to be considered for site selection of steam power plant.	**07**
		OR	
	(b)	A steam power plant is supplied with dry saturated steam at a pressure of 12 bar and exhausts into a condenser at 0.1 bar. Calculate the Rankine cycle efficiency. At 12 bar:h_f =798.4 kJ/kg h_{fg} =1984.3kJ/kg s_f=2.215 kJ/kg-K s_{fg} =4.304kJ/kg-K At 0.1bar:h_f =191.8kJ/kg h_{fg} =2393kJ/kg s_f=0.649 kJ/kg-K s_{fg} =7.502kJ/kg-K	**07**
Q.3	**(a)**	What is the compounding of steam turbine? Why is it necessary? State the different types of compounding of Impulse turbine.	**07**
	(b)	Explain the working of Pressurized water reactor with neat sketch.	**07**
		OR	
Q.3	**(a)**	Explain the governing of Pelton wheel with neat sketch.	**07**
	(b)	Classify the steam turbine.	**07**
Q.4	**(a)**	In a De-lavel turbine, the steam enters through a nozzle with a velocity of 500 m/s and at an angle of 20^o to the direction of motion of the blade. The blade speed id 200m/s and the exit angle of the moving blade is 25^o. Find the inlet angle of the moving blade, exit velocity of steam and its direction and work done for 10 kg of steam.	**07**
	(b)	State the advantages and disadvantages of Diesel Power Plant.	**07**
		OR	
Q.4	**(a)**	A simple closed cycle gas turbine plant gets air at 1 bar and 15^{o}C, and compresses it to 5 bar and then heats it to 800^{o}C in heating chamber. The hot air expands in a turbine back to 1 bar. Find the power produced per kg of air supplied per second. Take C_P for the air as 1 kJ/kgK.	**07**
	(b)	Explain in details about the different cost associated with power plant.	**07**
Q.5	**(a)**	Explain working of the open cycle gas turbine with intercooling with the help of line sketch diagram.	**07**
	(b)	Why engine cooling is required? State the types of engine cooling system.	**07**
		OR	
Q.5	**(a)**	Describe the function of different components of Nuclear reactor.	**07**
	(b)	Define (1) Demand factor (2) Diversity factor (3) Plant capacity factor (4) Load factor (5) Peak load (6) Average load (7) Plant use factor.	**07**

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