Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (New) EXAMINATION – WINTER 2015

Subject Code:2140908 Date:30/12/2015

Subject Name: ELECTRICAL POWER GENERATION

Time: 2:30pm to 5:00pm 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)**	Enlist different types of nuclear reactors. Explain working of pressurized water nuclear reactor with suitable diagram.	**07**
	(b)	Define solar cell and solar array.	**02**
		Draw & explain the I-V and P-V characteristics of solar photovoltaic cell.	**05**
Q.2	**(a)**	Give comparison of steam power station and hydro power station.	**07**
	(b)	The annual consumption of domestic customer is 1500000 units and annual load factor is 40%. What will be the saving in the average unit cost, if the load factor improves to 100%? Consider two part tariff : Rs. 500 per kW of maximum demand per year + Rs. 0.40 per kWh.	**07**
		OR	
	(b)	Determine load factor at which the cost of supplying a unit of electricity from a Diesel and from a Steam station is same if the annual fixed and running charges are as follows :	**02** **05**

Diesel	Fixed Rs. 300/kW	Running Rs. 0.25/kWh
Steam	Fixed Rs. 1200/kW	Running Rs. 6.25/kWh

Q.3	**(a)**	Derive the equation for available wind power in terms of velocity of wind and diameter of turbine rotor.	**07**
	(b)	Explain concept of green building using solar energy.	**07**
		OR	
Q.3	**(a)**	Explain various components of wind energy conversion system with diagram.	**07**
	(b)	Explain construction & working of solar refrigeration plant with suitable figure.	**07**
Q.4	**(a)**	Explain in brief geared, direct drive and hybrid Wind Power Plant and give their comparison.	**07**
	(b)	Explain construction and working of DFIG with necessary diagram.	**07**
		OR	
Q.4	**(a)**	Enlist different types tarrif and explain any three types of tariff.	**07**
	(b)	For a steam power plant, explain functions of: (i) Air Pre Heater (ii) Cooling Tower (iii)ESP (iv) ID Fan (v) Super heater (vi) Condenser (vii) Boiler feed pump	**07**
Q.5	**(a)**	Explain functions of the following in relation to nuclear power station: (i) Control rod (ii) Moderator (iii) Coolant (iv) Heat exchanger	**07**
	(b)	Enlist various equipments used in substation & explain function of each in brief.	**07**
		OR	
Q.5	**(a)**	Explain arc suppression coil earthing in detail.	**07**
	(b)	Explain working and differences of open cycle and closed cycle gas turbine power plant with suitable figures.	**07**

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