Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – WINTER • 2014

Subject Code: 140902 **Date: 29-12-2014**

Subject Name: Electrical Power

Time: 02:30 pm - 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)**	Explain with diagram elements of hydro-electric power plant.	**08**
	(b)	Explain in brief: (i) Economizer. (ii) Super Heater (iii) ESP	**06**
Q.2	**(a)**	Write a short note on Nuclear Reactors.	**07**
	(b)	Describe with the help of a neat sketch the working of solar power plant. What are its salient features?	**07**
		OR	
	(b)	Draw the layout and explain how electrical power is generated in a Combined Cycle Power Plant.	**07**
Q.3	**(a)**	Derive the equation for inductance of three phase transmission line with unsymmetrical spacing. Assume transposition.	**07**
	(b)	A single phase transmission line has two parallel conductors 3 m apart, the radius of each conductor being 1 cm. calculate the loop inductance per km length of the line if the material of the conductor is i) copper ii) steel with relative permeability of 100.	**07**
		OR	
Q.3	**(a)**	Derive expression for capacitance of single phase transmission line taking into account the effect of earth.	**07**
	(b)	Discuss the various conductor materials used for overhead lines. What are their relative advantages and disadvantages?	**07**
Q.4	**(a)**	Explain different types of distribution system with diagram.	**07**
	(b)	What is string efficiency? Explain various methods of improving string efficiency	**07**
		OR	
Q.4	**(a)**	Classify the underground cables according to insulation used, voltage rating and number of cores .Sketch a typical 3 – core cable and label the important parts.	**07**
	(b)	Each conductor of a 3 phase high voltage transmission line is suspended by a string of 4 suspension type disc insulator. If the potential difference across the second unit from top is13.2kVand across the third from top is 18 kV, determine the voltage between conductors.	**07**
Q.5	**(a)**	What are disadvantages of low power factor? Explain methods of improving power factor.	**07**
	(b)	Explain following methods of earthing with diagram. (i) arc suppression coil earthing (ii) voltage transformer earthing	**07**
		OR	
Q.5	**(a)**	Explain function of various equipments used in substation.	**07**
	(b)	Draw a neat layout of a 132/33 KV substation having two 132 KV incoming line & four 33 KV out going lines. Show essential equipments in the diagram	**07**

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