Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC – SEMESTER-VI EXAMINATION – WINTER 2016

Subject Code:X60904 **Date:24.10.2016**

Subject Name: Power system practice and design

Time:10.30 AM TO 01.00 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)**	What are corona losses? Discuss its significance and permissible limit. Explain Peek's and Peterson's formula for calculating the corona loss.	**07**
	(b)	Discuss the following factors to be taken into consideration in the mechanical design of a transmission line. 1. Loading on the conductors. 2. Span, sag and tension. 3. Clearance from the ground.	**07**
Q.2	**(a)**	Write a note on Gas Insulated substation.	**07**
	(b)	What is meant by insulation coordination? How are the protective devices chosen for optimal insulation level in a power system?	**07**
		OR	
	(b)	Explain the use of bundled conductors in EHV transmission lines. Also explain how the spacing, selection of size and number of conductors for the EHV lines is done.	**07**
Q.3	**(a)**	Discuss Kelvin's law to find the most economical conductor size. What are the Limitations of this law?	**07**
	(b)	How is the selection of arrester voltage rating, discharge current and discharge Voltage done?	**07**
		OR	
Q.3	**(a)**	Discuss the different interconnection issues with wind and solar pv hybrid power system.	**07**
	(b)	Discuss the selection of sizes and location of different generating power stations	**07**
Q.4	**(a)**	Draw the schematic of an HVDC system and hence explain its principle of operation. Discuss various types of HVDC links used.	**07**
	(b)	Explain any three applications of HVDC system.	**07**
		OR	
Q.4	**(a)**	Explain method of preparing stringing chart for overhead transmission line.	**07**
	(b)	Discuss the points in designing rural electrification	**07**

Q.5	**(a)**	Explain different types of substation and equipment used in substation.	**07**
	(b)	In a 33 kV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find (i) the distribution of voltage over 3 insulators and (ii) string efficiency.	**07**

OR

Q.5	**(a)**	Explain the method of measurement of earth resistance.	**07**
	(b)	A single phase a.c. distributor AB 300 metres long is fed from end A and is loaded as under : (i) 100 A at 0·707 p.f. lagging 200 m from point A (ii) 200 A at 0·8 p.f. lagging 300 m from point A The load resistance and reactance of the distributor is 0·2 Ω and 0·1 Ω per kilometer. Calculate the total voltage drop in the distributor. The load power factors refer to the voltage at the far end.	**07**

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