Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

PDDC - SEMESTER–VI - EXAMINATION – SUMMER 2014

Subject Code: X60903 **Date: 03-06-2014**

Subject Name: High Voltage Engineering

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)**	Explain the different schemes for cascade connection of transformers for producing very high a.c. voltages.	**07**
	(b)	What is the principle of operation of a resonant transformer? How is it advantageous over the cascade transformer units, if the power requirement is large?	**07**
Q.2	**(a)**	Define the front and tail times of an impulse wave. How are the front and tail times controlled in impulse generator circuits?	**07**
	(b)	What is trigatron gap? Explain its function and operation.	**07**
		OR	
	(b)	Explain working principle, construction and applications of van-de-graff generator.	**07**
Q.3	**(a)**	Explain electrostatic voltmeters with diagram.	**07**
	(b)	Explain the different methods of high current measurements with their relative merits and demerits.	**07**
		OR	
Q.3	**(a)**	What is meant by insulation coordination? How are the protective devices chosen for optimal insulation level in a power system?	**07**
	(b)	With suitable illustrations explain how insulation level is chosen for various equipments in a 230/132 KV substation.	**07**
Q.4	**(a)**	Explain the high voltage Schering bridge for the tan δ and capacitance measurement of insulator or bushings.	**07**
	(b)	Why synthetic testing method is is advantageous over the other testing methods for short circuit tests? Give the layout of synthetic testing.	**07**
		OR	
Q.4	**(a)**	What is thermal breakdown in solid dielectrics, and how is it practically more significant than other mechanisms?	**07**
	(b)	What is paschen's Law? How do you account for the minimum voltage for breakdown under a given condition?	**07**
Q.5	**(a)**	What is stressed oil volume theory? How does it explain breakdown in large volumes of commercial liquid dielectrics?	**07**
	(b)	Explain the different characteristics of liquid dielectrics.	**07**
		OR	
Q.5	**(a)**	What are electronegative gases? Why is the breakdown straight higher in these gases compared to that in other gases?	**07**
	(b)	A 12 stage impulse generator has 0.126 μF capacitors. The wave front and the wave tail resistances connected are 800 ohms and 5000 ohms respectively. If the load capacitor is 1000 pF. Find the front and tail times of the impulse wave produced?	**07**

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