Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VI • EXAMINATION – SUMMER 2013**

**Subject Code: 160904 Date: 29-05-2013**

**Subject Name: High Voltage Engineering**

**Time: 10.30 am - 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | Explain corona discharge. Discuss concept of positive corona and negative corona. | **07** |
| | **(b)** | Explain streamer theory of breakdown in gases. | **07** |
| **Q.2** | **(a)** | What is Paschen's law? Explain significance of existence of minimum sparking potential in paschen's curve. | **07** |
| | **(b)** | Explain Thermal breakdown in solid dielectric. | **07** |
| | | **OR** | |
| | **(b)** | Explain breakdown and filteration tests for liquid dielectric. | **07** |
| **Q.3** | **(a)** | Explain cavitation & bubble theory and stressed oil volume theory of liquid dielectric. | **07** |
| | **(b)** | A 10 stage cockraft-Walton circuit has all capacitors of 0.06 µF. The secondary voltage of the supply transformer is 100KV at a frequency of 150 Hz. If the load current is 1 mA, Determine<br>(1) voltage regulation (2) The ripple<br>(3) The optimum number of stages for maximum output voltage.<br>(4) The Maximum output voltage. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Draw & explain Marx circuit and modified Marx circuit of multistage impulse generator. Discuss differences between these two. | **07** |
| | **(b)** | Write short notes on Van de Graaff Generator. | **07** |
| **Q.4** | **(a)** | Explain how a sphere gap can be used to measure the peak value of voltages. What are the parameters & factors that influence such voltage measurements. | **07** |
| | **(b)** | What is meant by insulation co-ordination? How are the protective devices chosen for optimal insulation level in a power system? | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Discuss measurement of dielectric constant and loss tangent of capacitor. | **07** |
| | **(b)** | Explain partial measurement test for insulation quality assessment. | **07** |
| **Q.5** | **(a)** | Draw & explain series capacitor peak voltmeter | **07** |
| | **(b)** | Explain test facilities and testing equipments in high voltage Laboratories. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Discuss High Voltage Schering Bridge. | **07** |
| | **(b)** | Explain with neat diagram the principle of operation of an electrostatic voltmeter. Discuss its advantages and limitations for high voltage measurements. | **07** |

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