

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) - EXAMINATION – SUMMER 2016****Subject Code:2160904****Date:13/05/2016****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) Describe the working of Van de Graff generator with neat diagram. **07**
(b) Define Townsend's first and second ionization coefficient. Explain Townsend's discharge. **07**
- Q.2** (a) Explain vacuum breakdown. **07**
(b) Explain various theories for breakdown in commercial liquids. **07**
- OR**
- (b) Explain solid breakdown due to treeing and tracking. **07**
- Q.3** (a) Draw and explain Marx circuit and modified Marx circuit of multistage impulse generator. **07**
(b) What is principle of operation of a resonant transformer? List out its advantages and disadvantages. **07**
- OR**
- Q.3** (a) A ten stage Cockcroft-Walton circuit has all capacitors of $0.06 \mu\text{F}$. The secondary voltage of the supply transformer is 100 kV at a frequency of 150 Hz. If the load current is 1mA determine:
1.Voltage Regulation,
2.The Ripple,
3. The optimum number of stages for maximum output voltage **07**
- (b) Explain cascade connection for producing ac high voltage. Explain use of isolating transformer. **07**
- Q.4** (a) What are different methods of high DC voltage measurement? Explain Generating voltmeter method in detail. **07**
(b) Explain capacitive voltage transformer with its schematic representation, equivalent circuit and phasor diagram. **07**
- OR**
- Q.4** (a) Explain series capacitor peak voltmeter. **07**
(b) What is meant by insulation co-ordination? How are the protective devices chosen for optimal insulation level in a power system? **07**
- Q.5** (a) Explain with neat sketch the mechanism of lightning discharge. **07**
(b) What are partial discharges and how are they detected under power frequency operating conditions? **07**
- OR**
- Q.5** (a) Explain impulse testing of power transformer? **07**
(b) Explain test facilities and layout of high voltage laboratory. **07**
