FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI

SCHOOL OF ENGINEERING AND ENGINEERING TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

2009/10 HARMATTAN SEMMESTER EXAMINATION MAY, 2010

PSE 507: HIGH VOLTAGE ENGINEERING TIME ALLOWED: 3 hours

INSTRUCTION: Answer any 5 questions

Q1. Explain with diagrams, the 4 most common methods of obtaining Direct current (DC) at high voltages

Q2a. Explain the different methods of producing switching impulses in test laboratories.

b. A 12-stage impulse generator has 0.126μF condensers. The wave front and wave tail resistances connected are 800 ohms and 5000 ohms respectively. If the load condenser is 1000pF, find the front and tail times of impulse wave produced.

Q3. Write short notes on the following:

i. Series resistance micro-ammeter
ii. Resistance potential dividers with electrostatic voltmeter
iii. Series impedance voltmeters.

Q4. Write short notes on the following:

(a) Breakdown in Liquids
(b) Breakdown in Solids
(c) Breakdown in Gas

Q5. Describe Single Stage Impulse generator circuit; hence with mathematical equations analyze this circuit as you determine the V_t.

Q6a. State WHERE and WHAT high voltage can be used to test in high voltage laboratories.

b. Sketch a graphical representation of an impulse voltage; hence show its wave-tail and wave-front. Also show on the sketch, when the time voltage wave reaches 10% of the peak voltage and time in the voltage wave to reach 90% of the peak voltage.