

IV B.Tech I Semester Supplementary Examinations, April/May 2005
HIGH VOLTAGE ENGINEERING
(Electrical & Electronic Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE Questions
All Questions carry equal marks

1. What are the gases mainly used in insulating medium at high pressures? Which is more suitable? Why? What about its dielectric strength ? Explain.
2. (a) Derive an expression of Ripple voltage of a multistage Cockroft-Walton circuit
(b) A ten stage Cockroft-Walton circuit has all capacitors of $0.06 \mu F$. the secondary voltage of the supply transformer is 100 kv at frequency of 150 HZ. If the load current is 1 mA, Find
 - i. the optimum no.of stages for maximum output voltage
 - ii. the maximum output voltage
3. (a) Draw a typical impulse current generator circuit and explain its operation and application.
(b) A 12-Stage impulse generator has capacitors each rated at $0.3 \mu F$, 150 KV. The capacitance of the test specimen is 400 PF. Find the wave front and wave tail Resistances to produce a $1.2/50 \mu sec$. Impulse wave.
4. (a) Describe with a neat sketch, the working of a Van de Graf generator
(b) What are the factors that limit maximum voltage applied.
5. (a) Define the front and tail time of an impulse wave? What are the tolerances allowed as per the specifications?
(b) How is the basic arrangement modified to accommodate the wave time control resistances?
6. Write short notes on:
 - (a) Surge Recorder.
 - (b) Voltage Dividers
 - (c) Sphere gap.
7. (a) What are the conditions to be satisfied by a potential divider to be used for impulse measurement.
(b) A Ragowskii Coil is to be designed to measure impulse currents of 10 KA having a rate of change of current of 10^{10} A/sec. The current is read by a VTVM as a potential drop across the integrating circuit connected to the secondary. If the coil is used to measure impulse current of $8/20 \mu s$ wave and of the same peak current, what should be R – C integrating circuit.

8. (a) Draw a neat diagram of the high voltage Schering Bridge and analyze it for the balance condition. Also draw its phasor diagram. Assume series equivalent representation of the insulating material
- (b) List out the various tests to be carried out on a cable and give a brief account of each test

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