

**III B.Tech II Semester Supplementary Examinations, Apr/May 2006**  
**HIGH VOLTAGE ENGINEERING**  
**(Electrical & Electronic Engineering)**

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions  
All Questions carry equal marks

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1. (a) Derive the relationship between mobility and  $E/P$ .  
(b) What is drift velocity of gaseous ions by various factors. [8+8]
2. (a) Explain clearly the basic principle of operation of an electro static generator  
(b) Discuss the advantages and limitations of Van de graf generators [8+8]
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. [8+8]
4. (a) Why is a cockroft - Walton circuit preferred for voltage multiplier.  
(b) Explain cockroft - Walton circuit with a schematic diagram. [6+10]
5. (a) Draw and explain high current generator equivalent circuit.  
(b) A 6 stage impulse generator has capacitors each rated for  $0.2 \mu F$ , 150 KV. The capacitance of the test specimen is 400pF. Find the maximum output voltage if the charging voltage is 110KV. [8+8]
6. What are the requirements of a sphere gap for measurement of high voltages?  
Discuss the advantages of sphere gap for measurements. [16]
7. What are the problems associated with measurement of very high impulse voltages?  
Explain how these can be take care of during measurements? [16]
8. (a) Describe very briefly the problems associated in using a capacitive potential divider for the observation on the oscilloscope of an impulse voltage across a test device. Explain how these problems may be minimised.  
(b) With the aid of suitable diagrams briefly describe the measurement of dielectric constant and loss tangent of an insulating liquid. [8+8]

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