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R07

B.Tech IV Year I Semester (R07) Supplementary Examinations, May 2013

**HIGH VOLTAGE ENGINEERING**

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 80

Answer any FIVE questions

All questions carry equal marks

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1 (a) What is mean free path? Explain its importance.
(b) Discuss the principle of:
(i) Photo ionization.
(ii) Secondary ionization.

2 (a) How is the condition for breakdown obtained in a Townsend's discharge?
(b) What is a post breakdown phenomenon in gases? Explain.

3 (a) How does the "internal discharge" phenomena lead to breakdown in solid dielectrics?
(b) What is a composite dielectric and what are its properties?

4 (a) Discuss in detail about voltage multiplier circuits.
(b) Discuss ripple in cascaded voltage multiplier circuits.

5 (a) Derive an expression for voltage efficiency of single stage impulse generator.
(b) An impulse current generator has a total capacitance of $15\ \mu F$, the charging voltage of $125\ KV$, the circuit inductance is $2\ mH$ and the dynamic resistance is $1\ ohm$. Find the peak current and wave shape of the wave.

6 What are the requirements of a sphere gap for measurement of high voltages? Discuss the advantages of sphere gap for measurements.

7 How do you measure the high frequencies and impulse currents? Explain.

8 (a) How the dielectric constant and loss factor of an insulating material can be measured under high voltage condition at power frequency? Draw the necessary circuit diagram and explain the method.
(b) Explain the procedure for performing the partial discharge test.

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