US	N [06EE73
Seventh Semester B.E. Degree Examination, December 2010		
		High Voltage Engineering
Time: 3 hrs. Max. Marks:100		
e ^{ll}		Note: 1. Answer any FIVE full questions, selecting atleast TWO questions from Part – A and Part – B.
		2. Missing data may suitably be assumed.
1	a.	PART - A What are the advantages of transmitting electrical power at high voltages? (06 Marks)
	b.	Dynloin in built the need for any 1.1.1.1.
	c.	What are the applications of high voltages? (08 Marks)
2	a.	Write a brief note on 'breakdown in non uniform fields'. (08 Marks)
	b.	In an experiment in a certain gas, it was found that, the steady state current is 5.5×10^{-8} A at
		8KV at a distance of 0.4cm, between the plane electrodes. Keeping the field constant and
		reducing the distance to 0.1cm, results in a current of 5.5 × 10 ⁻⁹ A. Calculate Townsend's primary ionization coefficient.
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	O.	Describe Townsend's criteria for breakdown. (06 Marks)
3	a.	Explain suspended particle theory as applied to liquids. (08 Marks)
	b.	A solid dielectic specimen of dielectric constant of 4 shown in the figure Q3(b), has an
		internal void of thickness 1mm. The specimen is 1cm thick and is subjected to a voltage of
		80kV(rms). If the void is filled with air and if the breakdown strength of air can be taken as
		30kV(peak)/cm, find the voltage at which an internal discharge can occur. (06 Marks)
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		Fig.Q3(b)
		rig.Q3(0)
	c.	Write a brief note on 'thermal breakdown of solids'. (06 Marks)
4	a.	List the advantages of caring recoment singuit
•		List the advantages of series resonant circuit. (06 Marks) Describe in brief "Tesla coil". (08 Marks)
		A Cockroft – Walton type voltage multiplier has eight stages with capacitances, all equal to
		0.05 µF. The supply transformer secondary voltage is 125kV at a frequency of 150Hz. If the
		load current to be supplied is 5mA, find i) the percentage ripple and ii) the regulation.
		(06 Marks)
		(or that may

PART - B

5 a. Explain one method of controlled tripping of impulse generators. Why is controlled tripping necessary? (06 Marks)

b. A 12 stage impulse generator has $0.126~\mu F$ capacitors. The wavefront and the wavetail resistances are 800Ω and $5k~\Omega$ respectively. If the load capacitor is 1000 pF, find the front and tail times of the impulse wave produced. (06 Marks)

c. How are rectangular current pulses generated for testing purposes?

(08 Marks)

Important Note: 1. On completing year process. Assessmented from the state of

- 6 a. Explain the principle and construction of an electrostatic voltmeter for very high voltages.
 - b. A generating voltmeter has to be designed, so that it can have a range from 20 to 200kV d.c.
 If the indicating meter reads a minimum current of 2μA and maximum current of 25μA, what should the capacitance of the generating voltmeter be? Assume that the driving motor speed is 1500 rpm.
 (06 Marks)
 - c. Write a brief note on 'Klydonograph'.

(06 Marks)

- 7 a. Explain the high voltage Schering bridge for the tan δ and capacitance measurement of insulators. (08 Marks)
 - b. Describe the transformer ratio arm bridge for audio frequency range measurements.

(06 Marks)

- c. Discuss the method of balanced detection for locating partial discharges in electrical equipment. (06 Marks)
- 8 a. Mention the different electrical tests done on isolators and circuit breakers.

(10 Marks)

b. Describe various electrical tests done on transformers.

(10 Marks)
