Total No. of Questions : 5] [Total No. of Printed Pages : 3

Roll No. .....

EX–7101(N)

B. E. (Seventh Semester) EXAMINATION, Dec., 2010

(New Scheme)

(Electrical & Electronics Engg. Branch)

HIGH VOLTAGE ENGINEERING

(Elective – I)

[EX – 7101(N)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Answer all the *five* questions.

1. Answer any *two* of the following :
   (a) Explain the advantages of transmitting electrical power at high voltages. 10
   (b) Justify the need of generating high voltages in laboratory. 10
   (c) Elaborate upon the important aspects and practical applications of high voltages. 10

2. Answer any *two* of the following :
   (a) Deduce the Townsend's breakdown criteria. Also define the Townsend's primary and secondary ionisation coefficients. 10
   (b) Explain the various theories of breakdown mechanism of the commercial liquid di-electrics. 10

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(c) In an experiment of gas, it was found that at steady state current of $5 \cdot 5 \times 10^{-8}$ Amp. with 0·4 cm separation between the plates. For constant field if the separation reduces to 0·1 cm, results in a current of $5 \cdot 5 \times 10^{-9}$ Amp. Find Townsend primary ionisation coefficient. 10

3. Answer any *two* of the following :

(a) Describe the cascade transformer connection to generate high alternating voltages. 10

(b) What is Tesla Coil ? How are damped high frequency oscillations obtained from Tesla coil ? 10

(c) Answer the following :

(i) What are the applications of impulse current wave form of high magnitude ? 3

(ii) How are capacitance connected in an impulse generator ? 3

(iii) What are advantages of high frequency resonant transformer used in HVAC generation ? 4

4. Answer any *two* of the following : 10 each

(a) Tabulate the high voltage and high current measurement technique for different types of voltage and current.

(b) Explain sphere gap for measurement of high voltage with diagrams.

(c) With a neat sketch explain the principle of operation of an electrostatic voltmeter for HVAC measurement. What are its merits and demerits ?

5. Answer any *two* of the following :

(a) Discuss the various tests carried out on a circuit breaker in HV labs. 10

(b) Explain the following terms :

(i) Withstand voltage 2

(ii) Flashover voltage 2

(iii) 50 per cent flashover voltage 3

(iv) Wet and dry power frequency tests as referred to HV testing 3

(c) What are different tests conducted on cables ? Explain any *one* of them. 10