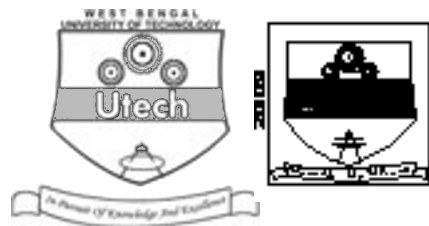


CS/B.TECH (EE) (SUPPLE)/SEM-7/EE-702D/09
HIGH VOLTAGE ENGINEERING (SEMESTER - 7)



1.
Signature of Invigilator

2.
Signature of the Officer-in-Charge

Reg. No.

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Roll No. of the
Candidate

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CS/B.TECH (EE) (SUPPLE)/SEM-7/EE-702D/09
ENGINEERING & MANAGEMENT EXAMINATIONS, JULY – 2009
HIGH VOLTAGE ENGINEERING (SEMESTER - 7)

Time : 3 Hours]

[Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
b) For **Groups – B & C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B					Group – C					Total Marks	Examiner's Signature
Question Number																						
Marks Obtained																						

.....
Head-Examiner/Co-Ordinator/Scrutineer

S-53024 (28/07)



**DO NOT WRITE
ON THIS PAGE**



CS/B.TECH (EE) (SUPPLE)/SEM-7/EE-702D/09
HIGH VOLTAGE ENGINEERING
SEMESTER - 7



Time : 3 Hours]

[Full Marks : 70

GROUP – A**(Multiple Choice Type Questions)**

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10
- i) The process of ionisation is brought about by
- a) positive ions only b) photons only
- c) metastables only d) all of these.
- ii) The breakdown voltage of a specimen is 65 kV at STP. The breakdown voltage of 73 cm Hg pressure and 35°C is
- a) 69 kV b) 63.25 kV
- c) 64.33 kV d) 60.39 kV.
- iii) Liquids with solid impurities
- a) have higher dielectric strength
- b) of large size have higher dielectric strength
- c) has lower dielectric strength as compared to pure liquids
- d) none of these.
- iv) High voltage Schering bridge is used to measure
- a) large capacitance without additional elements
- b) small capacitance without additional element
- c) medium value capacitances
- d) all values capacitances.



v) Sphere gap is used for measurement of

- a) A.C. voltage only
- b) D.C. voltage only
- c) impulse voltage of any wave shape
- d) both (a) and (b).

vi) While testing transformer oil for dielectric strength, the spherical electrodes are placed in

- a) horizontal configuration
- b) vertical configuration
- c) any configuration
- d) none of these.

vii) The peak value of lightning stroke currents are of the order

- a) 100 A
- b) 1000 A
- c) 10 to 100 kA
- d) 10^6 A.

viii) Streamer breakdown explain the phenomena of electrical breakdown of

- a) very short spark gaps
- b) when pd is less than 1000 torr-cm
- c) very long gaps where field is non-uniform
- d) none of these.

ix) Impulse voltage measurement with a CRO necessitates the use of

- a) a series capacitor
- b) a parallel inductor
- c) a diode
- d) a delay line.

x) Overhead transmission lines are protected from lightning over-voltages by

- a) counter poise wires
- b) protector tubes
- c) ground or shield wires above main conductors
- d) shunt reactors.



xi) Breakdown is permanent in

a) gases

b) liquids

c) solids

d) all of these.



xii) The salt-fog test done on insulators is

a) impulse test

b) power frequency pollution test

c) impulse current test

d) switching single test.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. Describe with a neat sketch, the principle of operation of a single stage impulse generator with a typical load.
3. Explain the mechanism of breakdown of gases.
4. Draw and explain the operation of a voltage doubler circuit to be used to generate high voltage D.C.
5. Explain how a spark gap can be used to measure the peak value of voltage.
6. What is insulation co-ordination and BIL ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following.

3 × 15 = 45

7. a) What is Paschen's law ? How the condition for minimum breakdown voltage in a gas is derived from Paschen's law ?
- b) What do you mean by 'thermal breakdown' in solid dielectrics ? Why is it more significant than other breakdown mechanisms in solid dielectric ?
8. List out various tests to be carried out on a cable and give a brief account of each test.

8 + 7



9. Explain with neat diagram the principle of operation of an electrostatic voltmeter. Discuss its advantages and limitations for high voltage measurements.
10. What is a cascaded transformer ? Explain why cascading done. Describe with neat diagram a three stage cascaded transformer. Label the power ratings of various stages of transformer.
11. Write notes on any *two* of the following : $2 \times 7 \frac{1}{2}$
- a) Finite difference method
 - b) Capacitance voltage transformer (CVT)
 - c) Routine test and type test
 - d) Surge absorber.

END