

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2064)

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B. Tech 6th Semester Examination

High Voltage Techniques & HVDC

EE-6003

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one from each of sections A, B, C, and D. Section E is compulsory.

SECTION - A

1. (a) What is an electron attachment? How it plays role in SF₆ insulating gas medium. (10)
- (b) Characterize uniform and non-uniform fields? How they influence electric breakdown of an insulation system? (10)
2. (a) Write name of five solid insulating materials. Can permittivity play role in providing better insulation? Out of five solid insulating material which has lowest and which material has high permittivity. (12)
- (b) Explain 'Bubble Theory' of breakdown of liquid insulations. (8)

SECTION - B

3. (a) Explain how transmission lines and substations are protected against lightning. (10)

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- (b) Write a few characteristics of lightning stroke. (10)
4. (a) What are various kind of high voltage tests which are normally carried out on power apparatus? (10)
- (b) Explain cascade connection of transformers. What tests are done through, such systems? (10)

SECTION - C

5. (a) What is an impulse generator? Explain working of Marx impulse voltage generator. (10)
- (b) What is role of front and tail resistances in an impulse generator equivalent circuit? (10)
6. (a) Explain one method for High Voltage Impulse Voltage. High voltage D.C. and High Voltage A.C. measurements for each set of such testing a high voltage equipment. (4×3=12)
- (b) What is cathode Ray Oscillograph? Explain its application in high voltage laboratory. (8)

SECTION - D

7. (a) What are various types of HVDC systems? Explain their advantages and disadvantages in electrical power transfer process. (12)
- (b) Name three major HVDC links that are currently already in operation in India. (8)
8. (a) Explain working of HVDC circuit breaker. (10)
- (b) Draw typical layout of an HVDC substation. (10)

SECTION - E

9. (a) Which insulating dielectrics are commonly employed in High voltage equipments?

- (b) What do you mean by Paschen's Law?
- (c) Write two advantages of corona in transmission lines?
- (d) Write five major properties of insulation liquids.
- (e) What do you mean by 'Tracking'?
- (f) Explain role of voids in solid insulations.
- (g) What is highest HVAC transmission voltage level existing in India?
- (h) What is a Standard Lightning Impulse Wave?
- (j) Define Insulation co-ordination?
- (j) What is a lightening arrester? (2×10=20)