

8E1914

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108213

8E1914

B.Tech. VIII Sem. (Main/Back) Examination, April/May - 2025

Electrical Engineering

8EE4 -11 HVDC Transmission System

Time : 3 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt All Ten questions from Part A, Five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. What are the main components of an HVDC system?
2. How does HVDC system Improves Power System Stability?
3. What is voltage source converter? How does VSC HVDC contribute to grid stability?
4. What is line commutated converter (LCC)? Why does LCC-HVDC require Ac filter?
5. What is the function of Pulse Width Modulation (PWM) in VSC control in HVDC system?
6. What is the role of smoothing reactor in HVDC transmission?
7. Write the basic requirements of AC and DC filters in HVDC transmission.
8. What are the main control strategies for HVDC stability enhancement?
9. How does HVDC prevent blackouts in Interconnected Power System?
10. What are the differences in an MTDC system over conventional HVDC system?

PART - B

(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. Describe the various components of HVDC system using schematic diagram. Also write the application of DC transmission.
2. Explain the operation of six pulse line commutated converter. Also derive the expression for Average DC output voltage and current.
3. Explain the following: **(2+2)**
 - a) Misfire and current extinction in LCC links.
 - b) Types of HVDC links.
4. Discuss the current and extinction angle control strategy to control the HVDC Converters.
5. What is multi-Terminal and multi-Infeed HVDC system? Also describe the series and parallel MTDC system.
6. What is corona effect in DC line of HVDC system. Also discuss the DC Brakers in HVDC system.
7. Write short note on: **(2+2)**
 - a) Modern Trends in HVDC Technology.
 - b) Twelve pulse converter.

PART - C

(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions.

(3×10=30)

1. Analysis the six pulse bridge converter operation in detail for three and four valve conduction mode in case of ignition delay.

2. Discuss the different types of Pulse Width Modulation (PWM) schemes in detail.
 3. Discuss the principles of Link Control in a VSC HVDC system.
 4. Explain the DC line faults in detail for (5+5)
 - a) LCC systems.
 - b) VSC systems.
 5. Compare the AC and DC transmission system in detail. Also discuss the voltage stability problems in AC/DC system.
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8E1814

8E1814

B.Tech. VIII-Sem. (Back) Examination, April/May - 2025

Electrical Engineering

8EE4-11 HVDC Transmission System

Time : 3 Hours

Maximum Marks : 120

Min. Passing Marks : 42

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of seven questions from Part B and Four questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory.

(10×2=20)

1. What are the advantages and disadvantages of HVDC transmission?
2. What are the advantages of a VSC based HVDC system?
3. What is a line commutated converter (LCC)?
4. What is the function of phase-locked loop (PLL) in HVDC Converters?
5. What is meant by frequency control in HVDC system?
6. Explain the importance of power flow control in HVDC transmission.
7. What is the function of filters in LCC based HVDC system?
8. Define power system stability in terms of HVDC transmission.
9. What are the problems related to AC/DC system stability in HVDC system?
10. What are the advantages of MTDC systems over conventional HVDC system?

PART - B

(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×8=40)

1. Compare AC and DC transmission in terms of cost, reliability and efficiency.
2. Explain the working of a six-pulse converter with a neat diagram.
3. Explain the concept of Selective Harmonic Elimination (SHE) in VSCs.
4. Explain the working of Current and Extinction Angle Control in HVDC transmission.
5. Explain the main components of an HVDC system with a detailed block diagram.
6. Compare synchronus and asynchronus links in HVDC transmission.
7. Explain the different types of MTDC configurations. Explain each with a diagram.

PART - C

(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Four questions.

(4×15=60)

1.
 - a) Explain commutation overlap and its effect on LCC performance.
 - b) Describe the principle and operation of a twelve pulse converter. **(7+8)**
 2.
 - a) Describe the importance of DC voltage regulation and the techniques used for its control.
 - b) Discuss the stability issues in HVDC control and methods to mitigate them. **(8+7)**
 3.
 - a) What is corona loss in HVDC transmission lines? Discuss the factors affecting it.
 - b) Explain the ground electrodes and their importance in HVDC system. **(7+8)**
 4.
 - a) Explain the firing angle controls in an HVDC system.
 - b) Compare LCC and VSC - based HVDC system. **(8+7)**
 5. Write short note on:
 - a) Multi-Terminal and Multi-Infeed system.
 - b) Sinusoidal Pulse with modulation (PWM) in VSC. **(7+8)**
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8E1937

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8E1937**110992****B.Tech. VIII Sem. (Main/Back) Examination, April/May - 2025****Open Elective-II****8AG6 - 60.1 Energy Management****Time : 3 Hours****Maximum Marks : 70****Instructions to Candidates:**

Attempt all Ten questions from Part A, Five questions out of seven questions from Part B and Three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A**(Answer should be given up to 25 words only)****All questions are compulsory.****(10×2=20)**

1. Define Energy.
2. What is Energy Management?
3. What do you mean by Commercial Energy?
4. Explain Energy Integration.
5. Energy Audit.
6. Discuss energy resources.
7. What are different energy sectors?
8. Describe energy pricing.
9. Write about LOW Grade Energy.
10. Explain Renewable Energy.

PART - B
(Analytical / Problem Solving Questions)

Attempt any Five questions.

(5×4=20)

1. List the primary and secondary energy sources. Also discuss the energy scenario of India.
2. Define energy conservation, mention its importance and describe energy conservation Act - 2001.
3. List the key instruments for energy audit and explain its functions.
4. Explain in detail about "Concept of Green Buildings".
5. Discuss the Cleaner energy sources.
6. Describe the energy demand management.
7. Explain energy forecasting techniques.

PART - C
(Descriptive / Analytical / Problem Solving / Design Questions)

Attempt any Three questions.

(3×10=30)

1. Explain different types of energy audit. Discuss in detail of about all three phases of energy audit.
 2. Write an essay on "Energy for sustainable Development".
 3. Explain different sources of Renewable energy also give its applications in different sectors.
 4. Discuss the importance of energy Management Information system (EMIS) to implement an Energy Management Programme.
 5. How the energy conservation can be made in the refrigeration and air condition based systems? Discuss in detail.
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