

WORK SHEET

UNIT-II

Converter and HVDC System Control

1. The primary purpose of DC link control in an HVDC system is to:

- A) Increase frequency
- B) Control power flow through the DC link
- C) Reduce transformer losses
- D) Eliminate harmonics completely

Answer: B

2. In HVDC converters, firing angle control is mainly used to:

- A) Control DC output voltage
- B) Increase AC frequency
- C) Reduce conductor resistance
- D) Eliminate corona loss

Answer: A

3. The firing angle of a thyristor converter is usually denoted by:

- A) β
- B) γ
- C) α
- D) δ

Answer: C

4. In rectifier operation, increasing the firing angle α results in:

- A) Increase in DC output voltage
- B) Decrease in DC output voltage
- C) No change in voltage
- D) Frequency reduction

Answer: B

5. Extinction angle control in HVDC systems is mainly associated with:

- A) Rectifier operation
- B) Inverter operation
- C) Transformer cooling
- D) Harmonic filtering

Answer: B

6. The extinction angle is generally represented by:

- A) α B) β C) γ D) θ

Answer: B

7. Source inductance in an HVDC converter causes:

- A) Voltage overlap during commutation
B) Frequency increase
C) Elimination of harmonics
D) Reduction in converter size

Answer: A

8. Due to source inductance, the converter output voltage:

- A) Increases
B) Remains constant
C) Decreases
D) Becomes zero

Answer: C

9. The overlap angle in converters increases with:

- A) Decrease in load current
B) Increase in source inductance
C) Decrease in firing angle
D) Reduction in AC voltage

Answer: B

10. Starting of an HVDC link generally begins with:

- A) Full-load operation immediately
B) Gradual increase of DC current
C) Disconnecting filters
D) Switching off converters

Answer: B

11. Stopping of a DC link is normally achieved by:

- A) Increasing AC voltage
B) Gradually reducing DC current to zero
C) Increasing firing pulses
D) Increasing extinction angle indefinitely

Answer: B

12. In HVDC systems, power control is mainly achieved by controlling:

- A) Frequency
- B) Firing angle
- C) Transformer turns ratio only
- D) Line inductance

Answer: B

13. HVDC converters consume reactive power mainly because of:

- A) DC transmission lines
- B) Converter operation
- C) Earth electrodes
- D) Smoothing reactors only

Answer: B

14. The reactive power requirement of HVDC converters is approximately:

- A) 5% of active power
- B) 10% of active power
- C) 50% of active power
- D) Equal to active power always

Answer: C

15. Which device is commonly used for reactive power compensation in HVDC systems?

- A) OLTC transformer
- B) Static VAR Compensator
- C) Circuit breaker
- D) Diesel generator

Answer: B

16. Static VAR Compensators (SVCs) are mainly used to:

- A) Generate DC voltage
- B) Supply or absorb reactive power
- C) Reduce conductor resistance
- D) Increase system frequency

Answer: B

17. During transient conditions in HVDC systems, reactive power control helps to:

- A) Increase harmonics
- B) Improve voltage stability
- C) Reduce insulation level
- D) Increase losses

Answer: B

18. Which of the following affects converter reactive power consumption?

- A) Firing angle
- B) Extinction angle
- C) Load current
- D) All of the above

Answer: D

19. The main advantage of proper reactive power control in HVDC systems is:

- A) Increased AC frequency
- B) Improved system stability and voltage profile
- C) Elimination of converters
- D) Reduced conductor temperature only

Answer: B

20. In inverter operation, failure of commutation may occur due to:

- A) Excessive extinction angle
- B) Insufficient extinction angle
- C) Low DC current
- D) Zero firing angle

Answer: B