



**Department of Electrical and Electronics Engineering**  
**EE8017- High Voltage Direct Current Transmission**  
**Unit I - MCQ Bank**

1. Which of the following are pros of HVDC over AC:

- a) Absence of Capacitance
- b) Absence of inductance
- c) Absence of phase displacement
- d) All of these**

Answer: d)

2. Symmetrical monopole converters are earthed with impedance:

- a) Zero
- b) Low**
- c) Medium
- d) High

Answer: b)

3. "Statement: Corona is violet glow, hissing noise and ozone formation phenomenon.

Assertion: DC lines have no corona"

- a) Statement is correct, assertion is wrong**
- b) Statement is wrong, assertion is correct
- c) Both are correct
- d) Both are wrong

Answer: a)

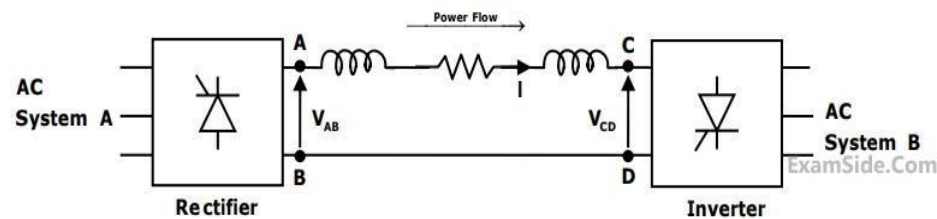
4. The most popular device used for HVDC system are:

a) Thyristors

b) MOS devices

Answer: a)

5. Power is transferred from system A to system B by an HVDC link as shown in the figure. If the voltage  $V_{AB}$  and  $V_{CD}$  are as indicated in the figure, and  $I > 0$ , then



a)  $V_{AB} < 0$ ,  $V_{CD} < 0$ ,  $V_{AB} > V_{CD}$

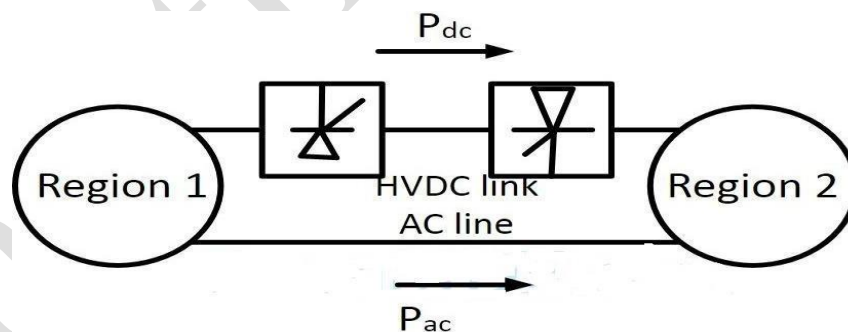
b)  $V_{AB} > 0$ ,  $V_{CD} > 0$ ,  $V_{AB} < V_{CD}$

**c)  $V_{AB} > 0$ ,  $V_{CD} > 0$ ,  $V_{AB} > V_{CD}$**

d)  $V_{AB} > 0$ ,  $V_{CD} < 0$ ,  $V_{AB} > V_{CD}$

Answer: c)

6. Two regional systems, each having several synchronous generators and loads are interconnected by an ac line and a HVDC link as shown in the figure. Which of the following statements is true in the steady state?



a) Both regions need not have the same frequency

b) The total power flow between the regions ( $P_{ac} + P_{dc}$ ) can be changed by controlling the HVDC converter alone

**c) The power sharing between the line ac line and the HVDC link can be changed by**

**controlling the HVDC converter alone**

d) The directions of power flow in the HVDC link ( $P_{dc}$ ) cannot be reversed

Answer: c)

7. An HVDC link consists of rectifier, inverter transmission line and other equipment's. Which one of the following is true for this link?

a) The transmission line produces/supplies reactive power

b) The rectifier consumes reactive power and the inverter supplies reactive power from/to the respective connected consumers

c) Rectifier supplies reactor power and the inverter consumes reactive power to/from the respective connected AC System

**d) Both the converters (Inverter and rectifier) consume reactive power from the respective connected AC System**

Answer: d)

8. High Voltage DC (HVDC) transmission is mainly used for

**a) Bulk power transmission over very long distances**

b) Interconnecting two systems with the same nominal frequency

c) Eliminating reactive power requirement in the operation

d) Minimizing harmonics at the converter stations

Answer: a)

9. Choose two appropriate auxiliary components of a HVDC transmission system from the following

1. D.C. line inductor

2. A.C. line inductor

3. Reactive power sources

4. Distance relays on D.C. line

5. Series capacitance of A.C. line

a) 1 and 2

**b) 1 and 3**

c) 2 and 4

d) 4 and 5

Answer: b)

10. Out of the considerations (i) to (iv) listed below,

(i) No distance limitation related to steady state stability

(ii) No reactive power requirement from the system at the two terminals

(iii) No substantial effect on fault level of the two systems at the terminals inspite of the inter connection

(iv) no corona problems

The considerations which constitute advantages of HVDC transmission are

a) All of the above

**b) (i) & (iii)**

c) (iii) & (iv)

d) (ii) & (iv)

Answer: b)

11. Bulk power transmission over long HVDC lines are preferred, on account of

a) Low cost of HVDC Transmission

b) No Harmonics Problem

**c) Minimum line power losses**

d) Simple protection

Answer: c)

12. HVDC transmission is preferred to EHVAC because

a) HVDC terminal equipment are inexpensive

b) VAR compensation is not required in HVDC systems

**c) System stability can be improved.**

d) Harmonics problem is avoided

Answer: c)

13. The HVDC converter

- a) Does not consume reactive power
- b) Consumes as much reactive power as real power
- c) **Consumes 50% of the real power**

Answer: c)

14. A back to back HVDC link can be advantageous compared to AC primarily because

- a) It is cheaper
- b) Of stability considerations
- c) **Of controlled power glow**

Answer. c)

15. Fault on a two terminal DC link is removed by

- a) Breakers on DC side
- b) Breakers on AC side
- c) **Current control of converters**

Answer. C)

16. Which among these HVDC projects are commissioned in India?

- a) Rihand - Delhi HVDC
- b) Vindhyachal Back to Back only
- c) Chandrapur only
- d) **All of these**
- e) None of these

Answer: d)

17. At what location are the shunt capacitors installed for voltages above 33 kV and above?

- a) Are located near the motors
- b) **Are installed in distribution substations**
- c) Both (A) and (B)
- d) None of these

Answer: b)

18. What is meant by Creepage Distance?

a) Shortest distance between two conducting parts along a stretched string.

**b) Shortest distance between two conducting parts along the surface of the insulating material.**

c) Distance between ground and the highest earthed point on the equipment.

d) All of these

Answer: b)

19. Which among these is a part of HVDC link?

a) Two earth electrodes

b) Converter valves

c) Bipolar DC line

**d) All of these**

e) None of these

Answer: d)

20. At what level is the load shedding carried out?

**a) Distribution level**

b) Transmission level

c) Both (A) and (B)

d) Depending upon the load

Answer: a)

21. What type of insulation is preferred for DC smoothing Reactors?

a. Air

**b. Oil**

c. Paper

d. Varnish

Answer: b)

22. The power transmission capability of bipolar lines is approximately

- a) same as that of 3-ph single circuit line**
- b) same as that of 3-ph double circuit line
- c) twice to that of 3-ph single circuit line
- d) half to that of 3-ph single circuit line

Answer: a)

23. HVDC system has charging current but no skin effect while transferring the power through it.

- a) True
- b) False**

Answer: b) Skin effect as well as the charging effect, both are absent in dc transmission system.

24. A dc line carries as compared to ac line

- a) more power**
- b) less power
- c) same power
- d) can't be decided

Answer: a)

25. Back to back HVDC is used to

- a) increase the transmission capability
- b) decrease line losses
- c) provide a stable connection**
- d) reduce the voltage drop

Answer: c)

26. HVDC transmission would require which of the following equipment's?

- (i) Pulse converter
- (ii) AC filter

- (iii) DC filter
- (iv) DC generator

**a) (i)**

b) (i), (ii)

c) (ii), (iv)

d) (i), (iii)

Answer: a)

27. As compared with the HVAC lines, dc transmission system is free from\_\_\_\_\_

a) inductance

b) capacitance

c) phase displacement

**d) all of the mentioned**

Answer: d)

28. Mostly the high voltage transmission is provided by overhead lines due to\_\_\_\_\_

**a) low cost**

b) low losses

c) easy installation

d) all of the mentioned

Answer: a)

29. Consider the below statements and choose the most appropriate.

(i) Guy wire is galvanised.

(ii) Guy wire should possess high conductivity.

(iii) At installation it makes an angle of 40-60 degrees with earth.

**a) (i), (ii) and (iii) are true**

b) Only (i) and (ii) are true

c) (ii) and (iii) are true

d) (i) and (iii) are true

Answer: a)



30. HVDC transmission lines are \_\_\_\_\_ as compared to HVAC lines.

- a) difficult to erect
- b) more expensive for long distances
- c) more expensive for short distances**
- d) less expensive for short distances

Answer: c)

31. In HVDC transmission lines

- a) both the stations operate as an inverter
- b) both the stations operate as a converter**
- c) one acts as a converter and other as an inverter
- d) depends upon the type of the load

Answer: c)

32. Two six pulse converters used for bipolar HVDC transmission system, are rated at 1000 MW,  $\pm 200$  kV. What is the dc transmission voltage?

- a) 200 kV
- b) 400 kV**
- c) 500 kV
- d) 100 kV

Answer: b)

33. Two six pulse converters used for bipolar HVDC transmission system, are rated at 1000 MW,  $\pm 200$  kV. Find the dc current in the transmission line.

- a) 500 A
- b) 25 A
- c) 2500 A**
- d) 5 A

Answer: c)

34. Two six pulse converters used for bipolar HVDC transmission system, are rated at 1000 MW,  $\pm$  200 kV. Find the rms current rating required for the SCRs.

- a) 2500 A
- b) 1350 A
- c) 1445 A**
- d) none of the mentioned

Answer: c)

35. For high power applications \_\_\_\_\_ are used as static switches whereas for low power applications \_\_\_\_\_ are used.

- a) Transistors, SCRs
- b) SCRs, transistors**
- c) Diodes, transistors
- d) SCRs, diodes

Answer: b)

36. \_\_\_\_\_ can be used as a single phase static ac switch.

- a) Diode
- b) SCR
- c) DIAC
- d) TRIAC**

Answer: d)

37. \_\_\_\_\_ can be used as a dc static switch.

- a) GTO
- b) Transistor
- c) Both GTO and transistor**
- d) TRIAC

Answer: c)

38. A single-phase ac switch is used in between a 230 V source and load of 2 kW and 0.8 lagging power factor. Determine the rms current rating required by the SCR. Use the factor of safety = 2.

- a) 10.87 A
- b) 87 A
- c) 21.74 A**
- d) 32 A

Answer: c)

39. Solid State Relays (SSRs) have

- a) moving parts
- b) no moving parts**
- c) a coil
- d) a contactor

Answer: b)

40. HVDC transmission has \_\_\_\_\_ as compared to HVAC transmission.

- a) smaller transformer size
- b) smaller conductor size**
- c) higher corona loss
- d) smaller power transfer capabilities

Answer: b)

41. The negative polarity is used in the Monopolar link because it

- a) uses less conductor size
- b) is safer
- c) produces less radio interference**
- d) has less resistance

Answer: c)

42. EHVDC transmission over large distance is cheaper than EHVAC transmission

**a) True**

b) false

Answer: (a)

43. Series capacitors are used to

a) Improve line voltage

**b) Compensate for line inductive reactance**

c) Compensate for line capacitive reactance

d) none of the above

Answer: (b)

44. Which of the following statement is true?

**a) Shunt reactors are used for power factors improvement**

b) Shunt reactor are used to control the line voltage

c) Shunt reactors are used to reduce the line impedance

d) Shunt reactors are used to eliminate line to ground capacitance

Answer: (a)

45. The HVDC converter

a. Does not consume reactive power

**b. Consumes as much reactive power as real power**

c. Consumes 50% of the real power

Answer: (C)

46. A back to back HVDC link can be advantageous compared to AC primarily because

a. It is cheaper

b. Of stability considerations

**c. Of controlled power glow**

Answer: (C)

47. In HVDC converters, the thyristor are connected in series

- a) To provide the required current rating, and they are turned on at the same instant.
- b) To provide the required current rating, and they are turned on at different instants.
- c) To provide the required voltage rating, and they are turned on at the same instant.**
- d) To provide the required voltage rating, and they are turned on at different instants.

Answer: c)

48. Which of the following is/are the purpose/purposes of the transformers used in DC transmission systems?

- a) Voltage transformation between the AC and DC sides
- b) Galvanic separation between AC and DC sides
- c) Control of voltage applied to the converter by using taps
- d) All of the above**

Answer: d)

49. Which of the following sentences about the different DC links is/are correct?

- a) In a Monopolar link, the conductor is usually of positive polarity since corona effects with positive polarity are substantially less than those with negative polarity.
- b) In a Monopolar link, the conductor is usually of negative polarity since corona effects with negative polarity are substantially less than those with positive polarity.**

Answer: b)

50. Which of the following sentences about the bipolar DC links is/are correct?

- 1) In a bipolar link, if grounding is provided at the rectifier end and is not provided at the inverter end, the currents in the two conductors are equal.
- 2) In a bipolar link, if grounding is provided at the inverter end and is not provided at the rectifier end, the currents in the two conductors are equal.
- 3) In a bipolar link, if grounding is provided at the rectifier end and is not provided at the inverter end, the currents in the two conductors are unequal.
- 4) In a bipolar link, if grounding is provided at the inverter end and is not provided at the

rectifier end, the currents in the two conductors are unequal.

- a) 1) and 3)
- b) 2) and 3)
- c) 1) and 4)
- d) 1) and 2)**

Answer: d)