Chettinad College of Engineering & Technology
Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai.

Department of Electrical and Electronics Engineering

EE8017- High Voltage Direct Current Transmission

Unit IV - MCQ Bank

1. Match the following:

Controllers	Functions
1) AC Controller	i) AC to DC
2) Rectifier	ii) Fixed Amplitude of AC into Variable Amplitude of AC
3) Inverter	iii) DC to AC

Option:

a) 1)-ii), 2)-i), 3)-iii)

b) 1)-i), 2)-ii), 3)-iii)

c) 1)-iii), 2)-ii), 3)-i)

Answer: a) 1)-ii), 2)-i), 3)-iii)

2. _____ is an AC controller which varies the applied voltage applied to the Inductor

a) TCSC

b) TCPST

c) TCR

d) STATCOM

Answer: c) TCR

3. Which Controller output voltage will be in quadrature with line current Independently

a) SSSC

b) TCSC

c) SVC

d) STATCOM

Answer: a) SSSC

ChettinadTech

4. Power transfer through AC systems depends on

a) sending and receiving end voltages

b) phase angle difference between sending end and receiving end voltages

c) reactance of the line

d) all of the above

Answer: d) All of the above

5. Power transfer in DC line depends on

a) sending and receiving end voltages

b) number of pulses in the rectifier

c) line resistance

d) none of the above

Answer: a) sending and receiving end voltages

6. Advantage of DC link for power transfer is

a) easy controllability of power

b) more economical

c) it is an asynchronous tie

d) less insulation requirement

Answer: a) easy controllability of power

7. Control of power in DC link is necessary because

a) current order setting needs to be done

b) power can be reversed

c) current sensitive to voltage changes and may damage the converters

d) all of the above

Answer: c) current sensitive to voltage changes and may damage the converters

8. With increase in delay angle α

a) p.f. is reduced

b) DC voltage decreases

ChettinadTech

c) both (a) and (b)

d) kVAR requirement decreases

Answer: c) both (a) and (b)

9. For inversion or inverter operation

a) $\alpha \leq 90°$

b) $\alpha > 90°$

c) $90° < \alpha < 180°$

d) $180° < \alpha < 270°$

Answer: c) $90° < a < 180°$

10. For stable operation of DC systems

a) CC and CEA control is adopted

b) α control, CC and CEA is adopted

c) only CEA control is adopted

d) only CC control is adopted

Answer: b) α control, CC and CEA is adopted

11. Extinction angle У is optimised so that

a) DC current is kept minimum

b) kVAR requirement is minimum

c) DC output voltage is minimum

d) all of the above

Answer: b) kVAR requirement is minimum

12. Characteristic of a converter is the relation between

a) AC voltage and I_d

b) DC output voltage and I_d

c) DC power and I_d

d) α and I_d

Answer: b) DC output voltage and I_d

13. The common control done in converters is

a) rectifier as both voltage and current controller

b) inverter as both voltage and current controller

c) inverter as current controller

d) rectifier as voltage controller and inverter as current controller

Answer: d) rectifier as voltage controller and inverter as current controller

14. Power reversal in DC link is done

a) operating rectifier (α) close to 180° and inverter (У) close to zero

b) operating both (α) and (У) near 90°

c) operating α at 90° and У close to zero

d) operating У close to 90° and α near zero

Answer: a) operating rectifier (α) close to 180° and inverter (У) close to zero

15. In case of IPC cosine control, DC output voltage is proportional to

a) control voltage

b) DC current

c) cos–1 of phase angle on AC side

d) overlap angle μ

Answer: a) control voltage

16. Main drawback of CEA control is

a) it cannot offer stable operation in weak AC links

b) more reactive kVAR are needed

c) control is uneconomical

d) generates harmonics

Answer: a) it cannot offer stable operation in weak AC links

17. Firing angle control in modern HV converters is

a) IFC

b) EPC

c) IPC

d) both (a) and (b)

Answer: d) both (a) and (b)

18. In HVDC link with CC control

a) power loss is more

b) short circuit current is limited

c) both (a) and (b)

d) none of the above

Answer: c) both (a) and (b)

19. Commutation failure usually occurs in

a) rectifiers

b) inverters

c) both inverters and rectifiers

d) controllers

Answer: a) rectifiers

20. In order bring the voltage of operation to the normal voltage level as the power varies, control done is

a) α control

b) transformer tap changing

c) У control

d) both α and У control

Answer: b) transformer tap changing

21. technology is often used as a synchronous voltage source

a) Current Source Converter

b) Voltage Source Converter

c) Both a) and b)

ChettinadTech

d) None

Answer: b) Voltage Source Converter

22. Which of the following are power flow control method?

a) Fundamental frequency control

b) Pulse width modulation

c) Both a) and b)

Answer: c) Both a) and b)

23. If capacitor is interfaced with the ac supply through an ac controller, then a _____ must be added to limit the inrush current

a) Series Capacitor

b) Series Inductor

c) Shunt capacitor

d) Shunt Inductor

Answer: b) series Inductor

24. _____ is an ac controller which varies the voltage applied to the inductor.

a) TCSC

b) TCR

c) TCPST

Answer: b) TCR

25. _____ is an ac controller which provides continuously controllable lagging VARs and line voltage dependent.

a) TCSC

b) TCR

c) TCPST

Answer: b) TCR

ChettinadTech

26. _____ is an ac controller to continue adjust the apparent reactance inserted in series with the line

a) TCSC

b) TCR

c) TCPST

Answer: a) TCSC

27. _____ is an ac controller which allows the control of the load angle between two buses in a transmission line

a) TCSC

b) TCR

c) TCPST

Answer: c) TCPST

28. _____ is varied by injection in series of a controlled amount of voltage in quadrature with the line phase shift

a) Current Phase Shift

b) Voltage Phase Shift

Answer: b) Voltage Phase Shift

29. The use of _____ switching device allows gating the switches more than one cycle

a) Force Commuted

b) Self-Commutated

Answer: b) Self-Commutated

30) The DC side harmonics increases significantly as delay angle move towards _____

a) 300

b) 600

c) 900

d) 1200

Answer: c) 900

31) Thyristor rectifier act as an _____ load

a) Inductive

b) Capacitor

Answer: a) Inductive

32) In the case of Thyristor Rectifier the power factor is _____ for all operating conditions

a) Lagging

b) Leading

c) Unity

Answer: a) Lagging

33) For a delay angle of _____ the converter operates as a reactive power compensator

a) 30^0

b) 60^0

c) 90^0

d) 120^0

Answer: c) 90^0

34) Lagging reactive power limitation is removed when thyristor replace by _____

a) Force Commuted Device

b) Self-Commutated Device

Answer: b) Self-Commutated Device

35) device allows implementation of PWM Pattern

a) Capacitive Reactive Compensator

b) Self-Commutated Device

c) Both a) and b)

Answer: c) Both a) and b)

ChettinadTech

35) In the PWM method

a) external commutating capacitors are required

b) more average output voltage can be obtained

c) lower order harmonics are minimized

d) higher order harmonics are minimized

Answer: c)

36) Which of the following is not a PWM technique?

a) Single-pulse width modulation

b) Multiple-pulse width modulation

c) Triangular-pulse width modulation

d) Sinusoidal-pulse width modulation

Answer: c)

37) In pulse width modulation

a) the output voltage is modulated

b) the input voltage is modulated

c) the gating pulses are modulated

d) none of the mentioned

Answer: c)

38) What are the effects of trouble caused by harmonics?

A. Harmonics

B. Voltage collapse

C. Over heating

D. Decrease magnetic loss

Answer: C. Over heating

39. The index THD can be calculated for

A. Current

B. Voltage

ChettinadTech

C. Current and voltage

D. Current or voltage

Answer: D. Current or voltage

40. What are the means to reduce harmonics?

A. Using filter and increasing the pulse number

B. Decreasing the pulse number

C. Using filter only

D. None of the above

Answer: A. Using filter and increasing the pulse number

41. What are the sources of harmonics?

A. Arcing devices and electronics and medical test equipment

B. Phase controllers and AC regulators

C. All of the above

D. None of the above

Answer: A. Arcing devices and electronics and medical test equipment

42. What is the use of tap changing transformer in HVDC systems?

A. Increase power factor obtained in ac side

B. Decrease power factor obtained in dc side

C. Increase power factor obtained in dc side

D. Decrease power factor obtained in ac side

Answer: A. Increase power factor obtained in ac side

43. The harmonics contained in the current waveform is given by

a. (np+1)

b. (np-1)

c. (np±1)

d. None of the above

Answer: C. (np±1)

44. Which of the following is not the feature of converter control?

a. Current order setting can be quickly and reliably changed depending on the requirement

b. Power reversal can be done easily and quickly

c. The stability margin is moderate

d. None of the above

Answer: C. The stability margin is moderate

45. Smoothing reactor is used on DC side to _____ DC current

a. Increase

b. Decrease

c. Smooth

d. None of the above

Answer: C. Smooth

46. When the three phase system is not grounded and if single line to ground fault occurs, the voltage of the other two healthy phases will

a. Increases

b. Decreases

c. Remains unaffected

d. None of the above

Answer: A. Increases

47. For an EHV equipment for maintenance first it should be isolated and connected to ground because

a. To provide low impedance

b. To discharge the charging capacitance to ground

c. Protection for operating personnel

d. Both B and C

Answer: D. Both B and C

ChettinadTech

48. The major components of a HVDC transmission system are _____

a. Converter transformer

b. Converter station

c. Smoothing reactor

d. Dc filter

Answer: B. Converter station

49. Smoothing reactor reduce the possibility ofin inverter

a. Voltage

b. Current

c. Commutation failure

d. None of the above

Answer: C. Commutation failure

50. The smoothing reactor is connected in _____ with the converters

a. Series

b. Parallel

c. Both A and B

d. None of the above

Answer: A. Series

51. _____ decrease the harmonic voltages and currents in the DC line

A. Smoothing reactor

B. AC filter

C. DC filter

D. None of the above

Answer: A. Smoothing reactor

52. The smoothing reactor is connected before

a. AC filter

b. DC filter

c. Reactor

ChettinadTech

d. None of the above

Answer: B. DC filter

53. A 12 pulse converter is obtained by series connection of two bridges with

a. 60 deg phase displacement between two source voltages

b. 30 deg phase displacement between two source voltages

c. 120 deg phase displacement between two source voltages

d. 90 deg phase displacement between two source voltages

Correct Answer: B. 30 deg phase displacement between two source voltages

ChettinadTech