



**Department of Electrical and Electronics Engineering**

**EE 8004 – Modern Power Converters**

**Unit III - MCQ Bank**

1. In case of a constant frequency system,  $T_{on} = (1/4)T$ . If the chopping frequency 2 kHz, find the value of  $T_{off}$ .

- a) (1/8) ms
- b) **(3/8) ms**
- c) (1/8)  $\mu$ s
- d) (3/8)  $\mu$ s

Answer(b)

2. In case of frequency modulation system, \_\_\_\_\_ is kept constant.

- a) T
- b)  $T_{on}$
- c)  $T_{off}$
- d) **Either  $T_{on}$  or  $T_{off}$**

Answer(d)

3. The control strategy in which on and off time is guided by the previous set of values of a certain parameter is called as

- a) time ratio control
- b) pulse width modulation
- c) **current limit control**
- d) constant frequency scheme

Answer(c)

4. In the current limit control method, the chopper is switched off when

- a) load current reaches the lower limit
- b) **load current reaches the upper limit**
- c) load current falls to zero
- d) none of the mentioned

Answer(b)

5. Which of the following mentioned control strategy/strategies would require a feedback loop?

- a) pwm
- b) constant frequency system

- c) **current limit control**  
d) none of the mentioned  
Answer(c)

6. In the current limit control method, when the load current reaches a predefined lower value, then  
a) the chopper is switched off  
b) **the chopper is switched on**  
c) the source voltage is removed  
d) load voltage goes to zero  
Answer(b)

7. In voltage fed thyristor inverters \_\_\_\_\_ commutation is required.  
a) load  
b) **forced**  
c) self  
d) any commutation technique can be used  
Answer(b)

8. The McMurray circuit is a  
a) commutation circuit  
b) **force commutated VSI**  
c) self commutated VSI  
d) none of the mentioned  
Answer(b)

9. Forced commutation requires  
a) a precharged inductor  
b) **a precharged capacitor**  
c) an overdamped RLC load  
d) a very high frequency ac source  
Answer(b)

10. Which elements are not present in the original McMurray inverter but are present in the modified McMurray inverters?  
a) Two auxiliary thyristors and the di/dt inductor  
b) **Two auxiliary diodes and the damping resistor**  
c) One auxiliary SCR and one auxiliary diode  
d) None of the mentioned  
Answer(b)

11. Let  $I_m$  be the maximum load current and  $V_m$  be the minimum supply voltage value. Then the expression for the design of commutation circuit parameters in a single-phase modified McMurray half-bridge inverter is given by

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- a)  $(1.5 \times I_m)/V_m$
- b)  $I_m/(1.5 \times V_m)$
- c)  **$V_m/(1.5 \times I_m)$**
- d)  $(1.5 \times V_m)/I_m$

Answer(c)

12. The number of diodes, SCRs and other components in full-bridge inverter McMurray inverter is \_\_\_\_\_ of those in half-bridge McMurray inverter.

- a) same
- b) **double**
- c) three times
- d) none of the mentioned

Answer(b)

13. In the single-phase modified McMurray full-bridge inverter, for commutating the main SCRs T1 and T2

- a) The capacitor is charged
- b) TA1 is triggered
- c) The commutation circuit is switched on
- d) **TA1 and TA2 are triggered**

Answer(d)

14. How many diodes are there in total in the single-phase, modified McMurray full-bridge inverter?

- a) 4
- b) 6
- c) **8**
- d) 10

Answer(c)

15. The McMurray-Bedford half-bridge inverter requires

- a) 4 SCRs, 2 diodes, 2 capacitors and 2 inductors
- b) 4 SCRs, 4 diodes, 2 capacitors and 2 inductors
- c) 2 SCRs, 4 diodes, 2 capacitors and 1 inductor
- d) **2 SCRs, 2 diodes, 2 capacitors and 2 inductors**

Answer(d)

16. The single-phase McMurray-Bedford type bridge inverter is a/an

- a) auxiliary-commutated inverter
- b) **complementary-commutated inverter**
- c) supplementary-commutated inverter
- d) none of the mentioned

Answer(b)

17. The external control of ac output voltage can be achieved in an inverter by

- a) connecting a cyclo-converter
- b) **connecting an ac voltage controller between the output of the inverter and the load**
- c) connecting an ac voltage controller between the dc source and inverter
- d) connecting an ac voltage controller between the load and the dc source

Answer(b)

18. The series-inverter control method is a/an

- a) internal voltage control method
- b) external frequency control method
- c) **external voltage control method**
- d) none of the mentioned

Answer(c)

19. In the series-inverter control method

- a) two inverters are connected back-to-back
- b) the output from the inverter is taken serially
- c) **output voltages of two inverters are summed up with the help of a transformer**
- d) output voltages of two inverters are summed up with the help of a third inverter

Answer(c)

20. In case of the series inverter control, if two inverters are connected in series through a transformer, and two secondary voltages are  $V_1$  and  $V_2$ , then the resultant output is given by

- a)  $V_1 + V_2$
- b)  $\sqrt{V_1^2 + V_2^2}$
- c)  **$[\sqrt{V_1^2 + V_2^2 + 2.V_1.V_2.\cos\theta}]^{1/2}$**
- d)  $[\sqrt{V_1^2 + V_2^2 + 2.V_1.V_2.\sin\theta}]^{1/2}$

Answer(c)

21. External control of dc input voltage can be obtained by the use of a

- a) transformer
- b) **chopper**
- c) inverter
- d) converter

Answer(b)

22. In the external control of dc input voltage

- a) a chopper is placed just after the inverter block
- b) a chopper is placed just after the filter block
- c) **a chopper is placed before the filter and the inverter block**
- d) none of the mentioned

Answer(c)

23. \_\_\_\_\_ method is an internal method for controlling the inverter output voltage.

- a) series connection of inverters
- b) chopper method
- c) commutating capacitor
- d) **pulse width modulation**

Answer(d)

24. 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)

25. 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)

66. 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)

27. 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)

28. 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)

29. 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)

30. 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)

31. 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)

32. 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)

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

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

Answer(d)

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

- a) GTO
- b) Transistor

c) **Both GTO and transistor**

d) TRIAC

Answer(c)

35. 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)

36. Solid State Relays (SSRs) have

a) moving parts

b) **no moving parts**

c) a coil

d) a contactor

Answer(b)