

QUIZ – ANSWER KEY

QUIZ NO: 103

TOPIC: ELECTRICAL ENGINEERING

DATE: 30/08/2022

1. Find the average output voltage for a type D chopper if it is given a dc supply of 220 V. Chopper frequency is 2 kHz and both the chopper switches are operated for 0.3 ms?

- [A] 220 V
- [B] 108 V
- [C] 98 V
- [D] 44 V

Answer: D

Explanation:-

- $T = 1/f = 0.5 \text{ ms}$
 $T_{on} = 0.3 \text{ ms}$
 $T_{off} = 0.2 \text{ ms}$
 $V_o = V_s (T_{on} - T_{off})/T = 220 \times (1/5) = 44 \text{ V}.$

2. Find the expression for average output voltage in a type D chopper on RL load ?

- [A] $V_s \times \text{Duty cycle } (\alpha)$
- [B] $V_s \times T$
- [C] $V_s \times (T - T)/T$

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[D] $V_s/2$

Answer: C

Explanation:-

During $T_{on} = V_s \times T_{on}/T$

During $T_{off} = -V_s \times T_{off}/T$

$V_o = V_s (T_{on} - T_{off})/T$.



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3. For a type D chopper, if duty cycle $\alpha < 0.5$ then the ?

- [A] average voltage is positive
- [B] average voltage is negative
- [C] average voltage is zero
- [D] none of the mentioned

Answer: B

Explanation:-

- $\alpha = T_{on}/T$
If $\alpha < 0.5$, $T_{on} < T_{off}$
The average value of voltage will be negative, as the switches will be off most of the times.

4. For a type D chopper, if duty cycle = 0.5 then the ?

- [A] average voltage is positive
- [B] average voltage is negative
- [C] average voltage is zero
- [D] chopper cannot be operated with duty cycle = 0.5

Answer: C

Explanation:-

- When $\alpha = 0.5$, $T_{on} = T_{off}$ hence the positive and negative value of voltages become equal. Making the average voltage = 0 V.

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5. For a type D chopper, the average value of output voltage will be positive when ?

[A] $T_{on} = T_{off}$

[B] $T_{on} < T_{off}$

[C] $T_{off} = 0$

[D] $T_{on} > T_{off}$

Answer: D

Explanation:-

When the chopper on time (SW1 and SW2) is more than the chopper off time than the average voltage will be positive. When the chopper switches are off, both the diodes are operating and the voltage is negative.

6. In a type-D chopper ?

[A] current can flow in both the directions of the load

[B] current cannot flow in both the directions of the load

[C] voltage can only be positive

[D] voltage can only be negative

Answer: B

Explanation:-

It is a two quadrant (I and IV) type B chopper. In quadrant I and IV current is only positive.

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7. A type D chopper is a ?

- [A] two quadrant type-B chopper
- [B] two quadrant type-A chopper
- [C] two quadrant type-C chopper
- [D] none of the mentioned

Answer: A

Explanation:-

It is a two quadrant (I and IV) type B chopper as load current is always positive but the voltage can be positive or negative.

8. 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

Explanation:-

In PWM, the gating pulses are modulated, i.e. the gating pulses or firing pulses are made to go on or off rapidly which changes the output voltage values accordingly.

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9. 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] $[V_1^2 + V_2^2 + 2.V_1.V_2.\cos\theta]^{1/2}$
- [D] $[V_1^2 + V_2^2 + 2.V_1.V_2.\sin\theta]^{1/2}$

Answer: C

Explanation:-

The resultant output will be the phasor sum of V_1 and V_2 .

10. 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

Explanation:-

It is an external voltage control method where the outputs of the two inverters are connected to the transformers where the secondary of the transformer sums up the two input voltages.

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