

QUIZ – ANSWER KEY

QUIZ NO: 147

TOPIC: ELECTRICAL ENGINEERING

DATE: 10/01/2023

1. For a power transistor, if the forward current gain $\alpha = 0.97$, then $\beta = ?$

- [A] 0.03
- [B] 2.03
- [C] 49.24
- [D] 32.33

Answer: D

Explanation: Use the relation $\alpha = \beta/(\beta+1)$.

2. The power electronics devices have a very high efficiency because ?

- [A] cooling is very efficient
- [B] the devices traverse active region at high speed & stays at the two states, on and off
- [C] the devices never operate in active region
- [D] the devices always operate in the active region

Answer: B

Explanation: They are efficient due to their higher transition speeds.

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3. For a power transistor, which of the following relations is true?

- [A] $I_e > I_c > I_b$
- [B] $I_b > I_c > I_e$
- [C] $I_c > I_e > I_b$
- [D] $I_e = I_b$

Answer: A

Explanation:

Practically speaking $I_e = I_b + I_c$. I_e is the highest as it is the sum of the collector and base currents. The base current is the smallest.

4. High frequency operation of any device is limited by the ?

- [A] forward voltage rating
- [B] switching losses
- [C] thermal conductivity
- [D] heat Sink arrangements

Answer: B

Explanation: Lower the switching losses higher the frequency of operation of the device.

5. The instantaneous power loss during the delay time of a transistor is given by ?

- [A] $I_c V_{ce}$
- [B] $I_b V_{be}$
- [C] $I_c V_{be}$
- [D] $I_b V_{ce}$

Answer: A

Explanation: During the delay time only the collector current flows & base to emitter voltage is zero.

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6. A 1mv of i/p gives an output of 1V, the voltage gain as such would be ?

- [A] 0.001
- [B] 0.0001
- [C] 1000
- [D] 100

Answer: C

Explanation: $1V/1mv = 1000$

7. Which of the following relations is true for a BJT?

- [A] $I_c \approx I_e$
- [B] $I_b \approx I_c$
- [C] $I_e \approx I_b$
- [D] $I_b \approx I_e \approx I_c$

Answer: A

Explanation: The collector & emitter current differ only by the base current, which is very very small.

8. Choose the correct statement ?

- [A] A transistor will remain on as long the the base current is applied
- [B] A transistor remains on after a high to low pulse is applied at the base
- [C] A transistor will remain on as long the the collector current is applied
- [D] A transistor remains on after a high to low pulse is applied at the collector

Answer: A

Explanation: Unlike the thyristor devices, all the transistor family devices remain in the conducting state as long as the firing pulses are applied. This is a very important property of the transistor devices.

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9. Let's say that a transistor is operating at the middle of the load line, then a decrease in the current gain would ?
- [A] move the Q point up
 - [B] move the Q point down
 - [C] result in to & fro motion of the Q point
 - [D] not change the Q point

Answer: B

Explanation: The current gain would decrease the collector current, shifting the Q point below.

10. Even after the forward current reduces to zero value, a practical diode continues to conduct in the reverse direction for a while due to the ?
- [A] resistance of the diode
 - [B] high junction temperature
 - [C] stored charges in the depletion region
 - [D] none of the mentioned

Answer: C

Explanation: Due to the stored charges during the earlier current flow, even when the current reduces to zero due to some structural properties of the device, the device takes time to sweep out the stored charges.

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