Applied Electronics I

Mock Model Exam Questions with their detailed Answers

1. When the temperature of a doped semiconductor increased, its Conductivity___

A) Increases or Decreases depending on whether it is P –or N-type

B) Decreases

C) Does not change

D) Increases

- Answer: D) ✓ When the temperature of a doped semiconductor is increased, the number of charge carriers increases since the thermal energy supplied to electrons in the valence band forces them to excite to the conduction band. As a result, the number of electrons in conduction band increases and holes in valence band increases so, conductivity increases.

2. In N type semiconductor, the position of Fermi level:

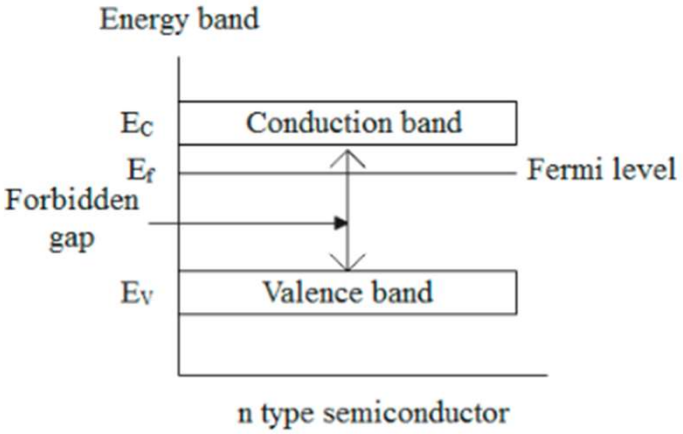
A) In Conduction Band

B) Near Conduction Band

C) Near Valance Band

D) In Valance Band

Answer: B) Near Conduction Band ✓



3. When the crystal diode current is large, the bias is_____

A) Forward
B) Small
C) Large
D) Reverse

Answer: A) ✓

4. You have an application for a diode to be used in a tuning circuit. A type of diode to use might be;

A) Schottky diode
B) Gunn diode
C) An LED diode
D) Varactor diode

Answer: D) ✓

Varactor diode is a simple variable capacitor that allows oscillator and other circuits to be easily tuned by applying a voltage

5. The forward characteristic of a diode has a slope of approximately 20mA/V at a desired point. The approximate incremental resistance of the diode is:

A) 50Ω
B) 20Ω
C) 35Ω
D) 10Ω

- Answer: A) ✓ The reciprocal of the slope of I-V graph gives the resistance of diode as: $1/\text{slope} = 1/(20\text{x}10^{-3}\ \text{A/V}) = 50\Omega$

6. The process of emitting photons from a semi-conductive material is called_____

A) Gallium Phosphide
B) Electroluminescence
C) Gallium Arsenide
D) Photoluminescence

- Answer: **B**) ✓ **Electroluminescence** is a process by which photons are generated when the excess electron–hole pairs are created by an electric current caused by an externally applied bias

7. In a PNP transistor, the current carriers are_____

A) Holes

B) Acceptor Ions

C) Free Electrons

D) Donor Ions

Answer: A) ✓ In a pnp transistor, current carriers are holes b/c holes are existed in excess amount than free electrons.

8. What configuration is widely preferred in cascading amplifier?

A) Common Source

B) Common Emitter

C) Common Collector

D) Common Base

- Answer: B) ✓**Common Emitter configuration** offers both current and voltage gain resulting in higher power gain than the other configurations

9. The lowest output Impedance is obtained in case of BJT amplifiers for:

A) CE with RE Configuration
B) CC Configuration
C) CE Configuration
D) CB Configuration

- Answer: B) ✓ The **CC amplifier configuration** has the lowest output Impedance compared to the other BJT Configurations

10. When transistors are used in digital circuits, they usually operate in the____

A) Saturation and Cutoff Region
B) Breakdown Region
C) Linear Region
D) Active Region

Answer: A) ✓ Since digital circuit is an electrical circuit that uses binary logic to process binary data either (0 or 1). Zero refers OFF while 1 represent ON.

A Transistor is used in digital circuits as ON switch in Saturation mode and OFF switch in Cutoff Mode

11. Often a common collector will be the last stage before the load.

The main function of this stage is:

A) To buffer the voltage amplifiers from the low resistance load and provide impedance matching for maximum power transfer

B) To provide phase inversion of the input signal

C) Provide a high frequency path to improve the frequency response

D) To provide voltage gain at the load

Answer: A) ✓

12. An N channel D-MOSFET with a positive VGS is operating in_____

A) The Depletion mode
B) Cutoff mode
C) The Enhancement mode
D) Saturation mode

Answer: C) ✓ The operating region with positive VGS in N channel D-MOSFET is called Enhancement operational region

13. Enhancement mode MOSFETs are more commonly used as

A) Buffers
B) Resistors
C) Switches
D) Capacitors

Answer: C) ✓

14. The total gain of a multistage amplifier is less than the product of the gains of individual stages due to_____

A) Loading effect of the next stage
B) Power loss
C) The use of many transistors
D) The use of many capacitors

Answer: A) ✓

15. What happens to the bandwidth if the total gain increased in cascade amplifiers?

A) Increases
B) Infinite
C) Remains the same
D) Decreases

Answer: D) ✓ In cascade amplifiers voltage gain increases which in turn reduces the bandwidth to maintain a constant gain-bandwidth product.

16. If Av, Ai and Ap represents the voltage gain, current gain and power gain ratio of an amplifier which of the following is correct expression for the corresponding values in decibel?

A) Current gain: 10log(Av) dB
B) Power gain:20log(Ap) dB
C) Power gain: 10log(Ap) dB
D) Voltage gain: 10log(Av) dB

Answer: C) ✓

Since

Current gain: 20log(Ai) dB
Voltage gain: 20log(Av) dB

Power gain: 10log(Ap) dB

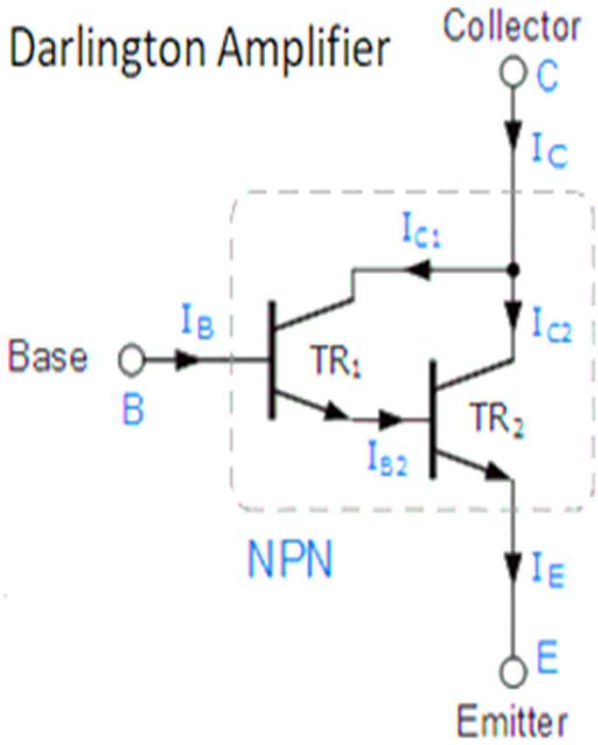
17. The main characteristics of a Darlington Amplifier are:

A) High input Impedance, Low output Impedance and High Current gain
B) High input Impedance, High output Impedance and High Current gain
C) Low input Impedance, Low output Impedance and High Current gain
D) Low input Impedance, Low output Impedance and Low Current gain

Answer: A) ✓

Darlington Amplifier has

- High input Impedance,
- Low output Impedance
- High Current gain



Good Luck