

UNIT-IV

ANALOG ELECTRONICS

1. Define Transistor

Transistor consists of two junctions formed by sandwiching either P-type or N-type semiconductor between a pair of opposite types.

2. What are the use of h - Parameters?

It perfectly isolates the input and output circuits. Its source and load currents are taken into account.

3. What are the advantages of transistors?

1. Low operating voltage. 2. Higher efficiency. 3. Small size and ruggedness

4. What is a PN junction diode?

PN junction diode is a two terminal unidirectional conduction device. It consists of a p-type and n-type semiconductor material joined together to form a junction.

5. Define the PIV of a PN junction diode.

PIV is defined as the maximum voltage that a diode can withstand under reverse biased condition.

6. What are the applications of PN junction diode?

The applications of a PN junction diode are,

1. As a switch,
2. In rectifier circuits,
3. In clipper and clamper (wave shaping) circuits,
4. In power supplies.

7. What is a zener diode?

A diode that exhibits zener effect is known as zener diode.

8. What is zener effect?

When the doping is heavy, even for the low reverse voltage, the electric field at the PN junction is strong. This results in the breakaway of covalent bonds and electrons are available for conduction. This is called zener effect.

9. What are the applications of zener diode? The applications of a zener diode are,

1. Voltage regulator,
2. To fix reference voltage in electronic circuits,
3. Clipper circuits,
4. Square wave generator.

10. Write the difference between PN junction diode and zener diode.

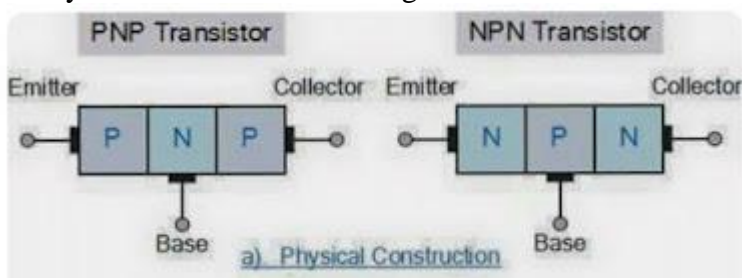
The differences between the PN junction diode and zener diode are tabulated below:

PN Junction Diode	Zener Diode
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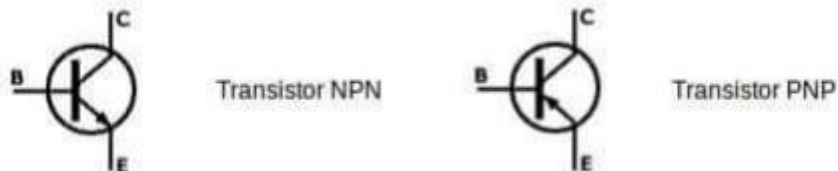
A p-type and n-type semiconductor material is joined together to form PN junction diode.	Zener diode is a diode that exhibits zener effect.
The junction is lightly doped.	The junction is heavily diode.
The reverse biased voltage – current characteristics is not sharp.	The reverse biased voltage – current characteristics is sharp.
The breakdown occurs at reverse voltage greater than 6V.	The breakdown occurs at reverse voltage less than 6V.

11. What is a Bipolar Junction Transistor (BJT)?

Bipolar Junction Transistor (BJT) is a three terminal semiconductor device and has two back to back PN junctions. The operation of BJT depends on the interaction of majority and minority carriers. BJT transfers signals from a low resistance to high resistance circuits.



12. Draw the symbol for PNP and NPN transistor.



13. Give the biasing conditions of BE (Base-Emitter) and BC (Base-Collector) junction for a transistor to operate as an amplifier.

The biasing conditions for a transistor to act as an amplifier are,
 BE (Base-Emitter) junction – forward biased,
 BC (Base-Collector) junction – reverse biased.

14. Why CE configuration of a BJT is widely used? Give reason.

The CE configuration is used for most of the transistor applications because of its high current gain.

15. Why CE configuration is used in amplifier circuits?

The CE configuration is used in amplifier circuits because of its high current gain and voltage gain.

16. Define current amplification factor.

In a transistor, working as an amplifier with ac input signal, the ratio of change in output current to the change in input current is known as Current amplification factor.

17. Give the applications of transistor in its three different configurations.

The applications of a transistor are,
 CB configuration - Used in high frequency circuits

CE configuration - Used in audio frequency circuits

CC configuration - Used for impedance matching.

18. What is a rectifier?

A rectifier is a device which converts alternating current (or voltage) into unidirectional current (or voltage).

19. What is PIV of a diode in a rectifier circuit?

Peak Inverse Voltage (PIV) is the maximum possible voltage that occurs across a diode when it is reverse biased.

20. What is the importance of peak inverse voltage?

If the applied voltage in reverse biased condition exceeds peak inverse voltage (PIV) rating of the diode, then the diode may get damaged.

21. Why half-wave rectifiers are generally not used in dc power supply?

The type of supply available from half-wave rectifier is not satisfactory for general power supply. That is why it is generally not used in dc power supply.

22. Why diodes are not operated in the breakdown region in rectifiers?

In breakdown region, a diode has a risk of getting damaged or burnt because the magnitude of current flowing through it increases in an uncontrollable manner. That is why diodes are not operated in the breakdown region in rectifiers.

23. Define ripple as referred to in a rectifier circuit.

The ac component contained in the pulsating output of a rectifier is known as ripple.