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1. Define vacuum.

The space where charged particles and all other matter are absent is called vacuum.

2. Define vacuum tube.

An electronic device which controls the flow of electrons in vacuum is called vacuum tube.

3. Who developed the first vacuum tube?

The first vacuum tube was developed by John Ambrose Fleming in 1904.

4. Who invented Audion vacuum tube?

Audion vacuum tube was invented by American electrical engineer Lee De Forest in 1906.

5. Which branch of engineering is formed after the invention of vacuum tubes?

Electronics engineering.

6. Which materials are used to construct vacuum tubes?

Glass and ceramic materials are used to construct vacuum tubes.

7. List different types of vacuum tubes

Vacuum tubes are mainly classified into four types:

1. Vacuum diode
2. Vacuum triode
3. Vacuum tetrode
4. Vacuum pentode

8. List various advantages of vacuum tubes.

1. Vacuum tubes are able to work at high temperature

2. It is easy to replace vacuum tubes

3. Vacuum tubes produce superior sound quality

9. List various disadvantages of vacuum tubes

1. High cost

2. Generate large amount of heat

3. High failure rate

4. High voltage is required to operate vacuum tubes

5. Consumes large power

6. Huge in size

10. Define vacuum diode.

An electronic device which allows electric current in one direction and blocks electric current in another direction is called vacuum diode.

11. What are the other names for vacuum diode

Vacuum diode is also called as Fleming value or thermionic tube.

12. Define electrode.

Electrode is a conductive material through which the free electrons enters or leaves.

13. Vacuum diode consists of how many electrodes?

Vacuum diode consists of two electrodes.

14. What are the two electrodes of vacuum diode?

The two electrodes of vacuum diode are cathode and anode or plate.

15. Define cathode.

Cathode is a negatively charged electrode that emits free electrons.

16. Define anode.

Anode is a positively charged electrode that collects free electrons.

17. What is the another name for cathode?

Cathode is also referred as emitter.

18. What is the another name for anode?

Anode is also referred as collector.

19. What is directly and indirectly heated cathode?

Directly heated cathode:

In directly heated cathode, heat is applied directly to the cathode. Hence, a small amount of heat energy is enough to emit free electrons from cathode surface.

Indirectly heated cathode:

In indirectly heated cathode, heat is not applied directly to the cathode because no electrical connection is present between cathode and heater. The heat energy is supplied to the heater and the heater will transfer its heat energy to cathode. As a result, more amount of heat energy is required to emit free electrons from cathode surface.

20. Define vacuum triode.

Vacuum triode is an electronic device that amplifies the electrical signal.

21.Who invented vacuum triode?

Vacuum triode was invented by the American electrical engineer Lee Dee Forest in 1906.

22. Vacuum triode consists of how many electrodes?

Vacuum triode consists of 3 electrodes.

23. What are the 3 electrodes of vacuum triode?

The 3 electrodes of vacuum triode are cathode, anode and control grid.

24. What is control grid.

Control grid is an electrode that controls the electrons flow between cathode and anode. Control grid is made of network of wires. It is placed between cathode and anode. The space between network of wires is very large. Therefore, the free electrons moves freely through the wires.

25. Define vacuum tetrode.

Vacuum tetrode is an electronic device which reduces the unwanted capacitance between anode and control grid.

26. Who invented vacuum tetrode?

Vacuum tetrode was invented by the American physicist Albert Wallace Hull in 1926.

27. Vacuum tetrode consists of how many electrodes?

Vacuum tetrode consists of 4 electrodes.

28. What are the 4 electrodes of vacuum tetrode?

The four electrodes of vacuum tetrode are:

1. Cathode
2. Anode
3. Control grid
4. Screen grid

29. Define screen grid

Screen grid is an electrode which is mainly used to reduce capacitance between control grid and anode. Screen grid is placed in between control grid and anode.

30. What are the main functions of screen grid?

The main functions of screen grid are as follows:

1. To reduce distortion
2. To increase gain
3. To increase control over electrons flow
4. To reduce capacitance between anode or plate and control grid

5. To accelerate and attract free electrons to the anode

31. Define vacuum pentode.

Vacuum pentode is an electrode used to repel secondary electrons back to anode.

32. Who invented vacuum pentode?

Vacuum pentode was invented by D.H. Tellegen in 1926.

33. Vacuum pentode consists of how many electrodes?

Vacuum pentode consists of 5 electrodes

34. What are the 5 electrodes of vacuum pentode?

The 5 electrodes of vacuum pentode are:

1. Cathode
2. Anode
3. Control grid
4. Screen grid
5. Suppressor grid

35. Define suppressor grid.

Suppressor grid is an electrode used to repel secondary electrons back to anode. Suppressor grid is placed in between screen grid and anode or plate.

36. List various advantages of vacuum pentode.

1. Vacuum pentodes have high amplification factor than tetrodes.
2. Vacuum pentodes are able to operate at high frequencies.

37. List various applications of vacuum pentodes?

The various applications of vacuum pentodes are as follows:

1. Microphone preamplifier
2. Professional audio
3. Electric guitar amplifiers
4. High power radio transmitter