

* What is microphone? and describe the operation of carbon microphone. With next diagram?

Ans: Microphone.

↳ A microphone is a device that translates sound vibrations in the air into electronic signals & stores them to a recording medium or over a loudspeaker.

Ans: Working principle (operation):

↳ The carbon microphone also known as bottom microphone or carbon transmitter is a type of microphone. Transducer that converts sound an electrical audio signal.

↳ Carbon is resistor, meaning it conducts electricity but not very well. A current runs from one plate through the carbon to the other plate.

↳ The carbon molecules normally resist if some what lowering the power flow.

↳ When a sound wave is pushed down on the top plate however, it squeezes the carbon molecules more tightly between the two plate.

Ans: Construction of carbon microphone:

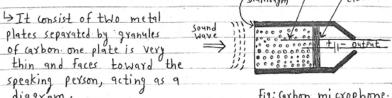


Fig: Carbon microphone.

↳ Sound waves striking the diaphragm cause it to vibrate, exerting a varying pressure on the granules which in turn changes the electrical resistance between the plates. Higher pressure lowers the resistance as the granules are pushed closer together.

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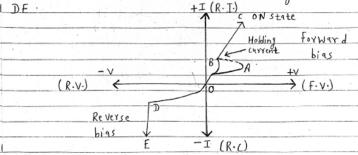
① Explain characteristics of SCR? (I-V)

② Forward characteristics: SCR.

↳ If the supply voltage is increased from zero a point reached (point A) when the SCR starts conducting. Under this condition, the voltage across SCR suddenly drops as shown by dotted curve AB and most of supply voltage appears across the load resistance.

③ Reverse characteristic: SCR.

↳ If the reverse voltage is gradually increased at first the anode current remains small and at some reverse voltage avalanche breakdown occurs and the SCR starts conducting heavily in the reverse direction as shown by the curve DE.



* Explain the Application of SCR?

① AC Voltage stabilizers.

② The SCR are used as switch.

③ The SCR are used AC power control with Solid relay.

④ The SCR is used in choppers.

⑤ It is used to power Control.

⑥ Power regulator and motor control.

Ans: Principle of operation of NPN transistor:

↳ It consists of a layer of P-doped semi-conductor between two layers of N-doped material where electrons are passed from the emitter to the collector, instead.

↳ The emitter then "emits" electrons into the base, with the base controlling the no. of electrons the emitter emits.

↳ The NPN transistor with forward bias to emitter base junction and reverse bias to collector base junction.

↳ This constitutes the emitter current I_E . As the base is lightly doped and very thin.

↳ Therefore, only a few electrons (less than 5%) combine with hole to constitute base current I_B . The remainder (more than 95%) cross over into the collector region to constitute collector current I_C .

* Explain how a transistor work as a switch?

↳ While a zero signal applied to base of the transistor it turns off acting like an open switch and zero collector current flows.

↳ With a positive signal applied to the base of the transistor it turns ON acting like a closed switch and maximum circuit current flows through the device.

↳ The simplest way to switch moderate to high amounts of power is to use the transistor with an open collector output and the transistor's emitter terminal connected directly to ground. When used in this way, the transistor's open-collector output can thus "sink" an externally supplied voltage to ground thereby controlling and connecting load.

* Explain the construction, working principle and function of cathod Ray Tube (CRT)?

Ans: Construction of CRT:



↳ The electron gun assembly deflection plate assembly. Fluorescent screen, glass envelope, base are the important part of the CRT. The electron gun emits the electron beam and through deflecting plates, it is struck on the phosphorous screen.

② Electron gun:

↳ The electron gun is the source of the electron beams. The electron gun has a heater, cathode, grid, pre-accelerating anode, focusing anode & accelerating anode.

③ Electrostatic deflection plates:

↳ The deflection plate produces the uniform electrostatic field only in the one direction.

④ Screen for CRT:

↳ The front of CRT is called the face plate. The face plate of the CRT is made up of entirely fiber optics which have special characteristics.

Ans: Working principle of operation:

↳ Cathode ray tube is a computer display screen used to display the output in standard composite video signal.

↳ The working of CRT depends on movement of an electron beam which move back and forth across the back of screen.

↳ The operation of CRT monitor is basically very simple. A CRT consist of one or more electron guns, possible internal electrostatic deflection plate and a phosphorous target.

CRT has three electron beams one for each (red, green and blue).

* What are the fields of electronic that it is used?

↳ The fields of electronic that it is used are given:

① Communication technology.

② Robotics and artificial intelligence.

③ Automobile technology.

④ Electrical & Electronics engineering design.

⑤ Network technology.

⑥ Industrial application.

⑦ Information technology.

* Communication technology:

↳ Electronic communication is any form of communication that is broadcast, transmitted, stored or viewed using electronic media, such as computer, phones, e-mail and video but each has specific uses and is better suited for certain scenarios.

* Information technology:

↳ Electronic is widely used in information, processing, Telecommunication and Signal processing. The ability of electronic devices to act as switches makes digital information processing possible.

* Engineering & physics:

↳ Electronics comprise the physics engineering technology and application that deal with the emission flow and control of electronics in vacuum and matter.

↳ Commonly Electronics device contain circuitry consisting primarily or exclusively of active semi-conductor supplemented with passive element such as a circuit as an electronic circuit.

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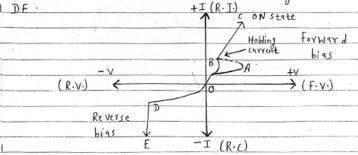
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* Explain the types of electronic switches?

Ans: Switch.

↳ switch is a device for making and breaking the connection in an electrical circuit.

↳ It interrupt the current and divert it from one conductor to another conductor.

↳ There are mainly 4 type of electronic switches.

① single pole single throw (SPST).

↳ It is a simple on/off switch. Fig:symbol

↳ It is a switch that only has a single input and can connect only to one output. This mean it only has one input terminal and only one output terminal.

↳ When the switch is close the circuit is open.

② Single pole Double throw (SPDT).

↳ It is a 3-way switch. Fig:symbol

↳ It is a switch that only has a single input and can connect to two output between the 2 outputs, that means it has one input terminal and two output terminals.

↳ It is a switch can serve a variety of function in a circuit.

③ Double pole single throw (DPST).

↳ It is a switch has for different terminals Fig:symbol

↳ and is often used to connect two source terminals to their respective output terminals (but never to each other).

↳ A DPST switch can be used in an "ON/OFF" configuration.

④ Double pole double throw (DPDT).

↳ A DPDT switch consists of six terminals

two of switch are independent input terminals.

Each of the poles can complete two different circuits.

Each input terminal connected with two output terminal.

Fig: V-I characteristics of P-N Junction diode.

⑤ Zener diode:

↳ When the P-N Junction diode is in zero bias condition, there is no external voltage applied and this means that the potential barrier at the Junction does not allow the flow of current.

⑥ Forward bias:

↳ When the P-N Junction diode is in forward bias condition, P-type is connect to the negative terminal while the N-type is connect to the positive terminal of the external voltage.

↳ When the diode is in forward bias, the current increases slowly and the curve obtained is non-linear as the voltage is applied to the diode overcome the potential barrier.

⑦ Reverse bias:

↳ When the P-N Junction diode is in reverse bias condition P-type is connect to the negative terminal while the N-type is connect to the positive terminal of the external voltage.

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* What is PN-Junction diode? Explain V-I characteristics of PN-Junction diode?

Ans: PN-Junction:

↳ P-N Junction is an interface or a boundary between two semi-conductor material type namely, P-type and N-type, inside a semiconductor.

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Fig: Circuit diagram

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