Name # Syed Muhammad Danyal Shah

ID # 15863

Course # Electronics

Module # 2nd

Q No 1 :-> Electronic components are widely used in the field of communication. Specify those equipment in which electronic components are used and describe the role of electronics in modern world technology?

Ans :-> Electronic has made tremendous advancement during last few decades and our day to day life involves the use of electronic devices. Electronic has played a major role in every sphere of our life. this can be proved with the following application of electronics.

Entertainment and communication

Name Syed Daniyal Shah ID 15863

Availability of enamical and fast means of communication covers the way for progress of a country. Few decades ago the main application of electronics was in the field of telephony and telegraphy. Now with the aid of radio waves we can transmit any message from one place to another without the use of wires. Radio and TV broadcasting offers a means of both entertainment as well as communication. Today Electronics gadgets are widely used for entertainment.

1. Defence Application
2. Industrial Application

1. Defence Application

Defence applications are completely controlled by electonic circuit. RADAR that is Radio Detection and Ranging is the mast important

Name Syed Danyal Shah ID 15863

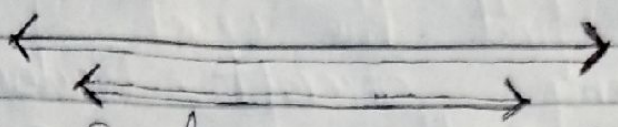
development in electronics field with the help of radar it is possible to detect and find the exact location of enemy aircraft. Radar and anti craft guns can be linked by an automatic control system to make a complete unit.

(2) Industrial Application :->

Electronics circuit are widely being used in industrial applications such as control of a material. Electronic amplefier circuits are used to amplify signals and thus control the operations of automatic door openers, power systems, ~~are used~~ and safety devices. Electronically controlled systems are used for heating and welding in the Industry. The most important Industrial application is that the power stations which generate thousands of megawatts of

Name Syed Danyal Shah ID 15863

electricity are controlled by tiny electronic devices and circuits.



Q No 2:→ Explain working principal of P-N junction diode in forward and reverse biased condition?

Ans :→ When the P-type and N-type Semiconductors are grown on the same crystal then the junction is formed where this P-type and N-type region meets. And this junction is known as the P-N junction. And the entire structure acts as a diode.

The forward biased P-N junction

In forward biasing, the p-type terminal is connected to the positive terminal of the battery. While then n-type is connected to the negative terminal of the battery.

And as we increase the external biasing voltage

Name Syed Daniyal Shah ID # 15863

the width of the depletion region reduces. So, the resistance offered by the depletion region (to majority carrier reduces).

And once the applied voltage is more than the built-in potential; the majority carries are able to cross this depletion region barrier. So, under the forward bias condition the current flows due to majority carries. And the direction of the current is from p to n side. (Electrons moves from n-side to p-side and holes move from P-side to n-side)

The reversed biased PN Junction

under, reverse biased PN Junction, the P-side is connected to the negative terminal of the battery and n-side is connected to the

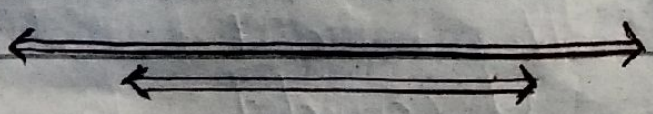
Name Syed Daniyal Shah ID 15863

positive terminal of the battery.

And as the reverse bias voltage increase, the width of the depletion region also increases. So the resistance offered by the depletion region also increases.

But in the reverse bias condition, we get a flow of current due to minority carriers. Due to the strong electric field the electrons get swapped from p-side to n-side and holes get swapped from n-side to P-side. So in the reverse biased condition, we get a little flow from n-side to P-side. (In the reverse direction than the forward biased condition)

And that's why this current is known as the reverse saturation current.



Name Syed Danyal Shah ID 15863

Q No 3 :-> Differentiate between the following?

1. Intrinsic Semiconductor
2. Doped Semiconductor
3. Carriers movement.

Ans :->

(1) INTRINSIC SEMICONDUCTOR

AN Intrinsic Semiconductor is an undoped Semicondutor. This means that holes in the valence band are vaconcies created by electrons that have been thermally excitted to the condition band, as apposed to doped Semiconductors where holes or electrons are supplied by a foregin atom acting as an impurity.

(2) Doped SEMICONDUCTOR

Name Syed Danyal Shah ID # 15863

IN Semiconductor production the process of creating extrinsic Semiconductors by adding Substance to a pure Semiconductor for the purpose of modulating its electrical properties is known as doping.

Semiconductors are doped to generate either a surplus or a deficiency in valence electrons.

CARRIERS MOVEMENT

There are two mechanisms by which holes and free electrons move through a silicon crystal.

1. Drift
2. Diffusion

1. DRIFT

The carrier motion is generated by the electrical field across

Name Syed Danyal Shah ID# 15863

a piece of Silicon.

(2) This motion will produce drift current.

(2) DIFFUSION :->

The carrier motion is generated by the different concentration of carrier in a piece of silicon.

The diffused motion usually carries diffuse from high concentration to low concentration will give rise to diffusion current.