Department of Electrical Engineering

Assignment

Date: 14/04/2020

Course Details

Course Title: __Electronics__ **Module:** 2nd

Instructor: Engr Sajid Nawaz **Total Marks:** 30

Student Details

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Q1	Electronics components are widely used in the field of communication. Specify those equipment in which electronics components are used and describe the role of electronics in modern world technology.	**(10 marks)**
Q2	Explain working principal of P-N junction diode in forward and reverse biased condition.	**(10 marks)**
Q3	Differentiate between the following ➢ Intrinsic Semiconductor. ➢ Doped Semiconductor. ➢ Carriers movement.	**(10 marks)**

Q1;

Answer:

- **Electronics components use in communication field**:

- Resistors
- Capacitors
- LEDs
- Transistors
- Inductors
- Integrated Circuits.

- **Equipments used in electronic components**:

- Multimeter; A multimeter is an electronic tester which measures voltage, current and other aspects of electricity and circuits.
- Soldering tools, to build permanent, reliable circuits, we need to solder connections between wires and components.
- Hand tools
- Breadboard
- Oscilloscope
- Power supply

- **Importance or Role of electronics in modern world technology** :

Electronics play very important role in modern technology in every field of world. If we talk about smart phone, computer its nothing without electronics. Electronics devices are used everywhere. health field, homes, industries etc.

Q2:

Answer:

- **P-N Junction diode in Forward bias condition:**

When we connect a positive terminal of a battery with P-type of a diode and N-type of a diode with negative terminal of battery is known as forward bias connection. The pn junction excited by a constant I current in the forward direction. The depletion layer narrows and the barrier voltage decreases by volts, which appears as an external voltage in the forward direction.

- **The P-N Junction diode in Reverse bias condition**:

When we connect a positive terminal of a battery with N-type of a diode and P-type of a diode with negative terminal of battery is known as Reverse bias connection. The pn junction excited by a constant I current in the reverse direction. To avoid breakdown I is kept smaller Is. The depletion layer widens and the barrier voltage increase by Vr volts

Q3;

Answer:

- **Intrinsic Semiconductor**:

Intrinsic Semiconductor is also called pure or undoped semiconductor. Intrinsic semiconductor made of pure semiconductor materials. In this semiconductor the number of electron and holes are equal. It's conductivity is poor. A semiconductor is extremely pure form is known as Intrinsic Semiconductor.

Example: Silicon and Germanium.

- **Doped Semiconductor:**

Doped Semiconductor is also called impure semiconductor. Doped semiconductor made of impure semiconductor materials. In this semiconductor In N-type electrons are in majority whereas in P-type holes are in majority. It's conductivity is large. A semiconductor is extremely impure form is known as doped semiconductor.

Example: For N-type Phosphorous (P), Antimony (Sb)

For P-type Gallium (Ga), Indium (In).

- **Carriers Movement**:

Carrier movement is the charge carriers in a semiconductor are the electrons and holes. Holes are unoccupied electron states in the valence band of the semiconductor. The valance band is completely filled band where every quantum state is occupied by the electron is zero.

There are two mechanisms by holes free electrons move though a silicon crystal:

1) Drift.

2) Diffused.