



**TAKORADI
TECHNICAL
UNIVERSITY**

OCTOBER 24, 2017

FACULTY OF APPLIED SCIENCES

HND ICT 200 A

07162734

LECTURER: RICHIE NANA NKETSIAH

**HARDWARE TECHNOLOGY I
ASSIGNMENT.**

Questions

Q1. What is an Adapter?

An adapter is a device for connecting pieces of equipment that cannot be connected directly. An AC adapter, AC/DC adapter, or AC/DC converter is a type of external power supply, often enclosed in a case similar to an AC plug. Other common names include plug pack, plug-in adapter, adapter block, domestic mains adapter, line power adapter, wall wart, power brick, and power adapter.



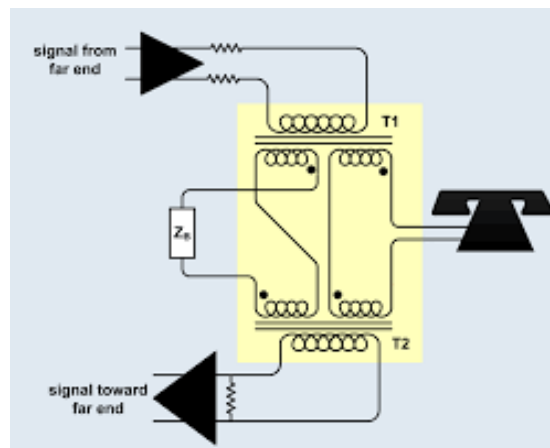
Q2. What is a Transformer?

A transformer is an apparatus for reducing or increasing the voltage of an alternating current. A transformer is an electrical device that transfers electrical energy between two or more circuits through electromagnetic induction. A varying current in one coil of the transformer produces a varying magnetic field, which in turn induces a voltage in a second coil. Power can be transferred between the two coils through the magnetic field, without a metallic connection between the two circuits. Faraday's law of induction discovered in 1831 described this effect. Transformers are used to increase or decrease the alternating voltages in electric power applications.



Q3. What work does a Transformer do?

Transformer works in A transformer is based on a very simple fact about electricity: when a fluctuating electric current flows through a wire, it generates a magnetic field (an invisible pattern of magnetism) or "magnetic flux" all around it. The strength of the magnetism (which has the rather technical name of magnetic flux density) is directly related to the size of the electric current. So the bigger the current, the stronger the magnetic field. Now there's another interesting fact about electricity too. When a magnetic field fluctuates around a piece of wire, it generates an electric current in the wire. So if we put a second coil of wire next to the first one, and send a fluctuating electric current into the first coil, we will create an electric current in the second wire. The current in the first coil is usually called the primary current and the current in the second wire is (surprise, surprise) the secondary current. What we've done here is pass an electric current through empty space from one coil of wire to another. This is called electromagnetic induction because the current in the first coil causes (or "induces") a current in the second coil. We can make electrical energy pass more efficiently from one coil to the other by wrapping them around a soft iron bar (sometimes called a core)



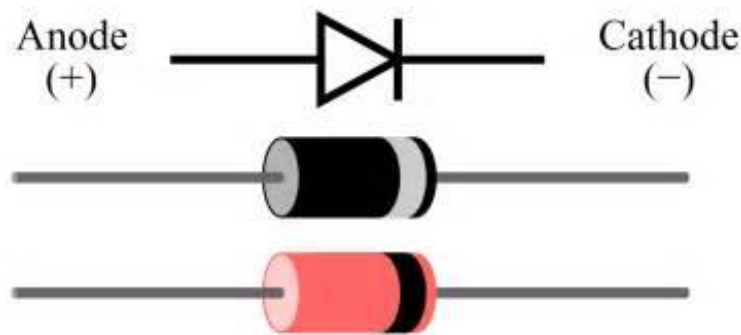
Q4. Exhibit knowledge about Rheostat?

Rheostat is an electrical instrument used to control a current by varying the resistance. The English scientist Sir Charles Wheatstone coined the word rheostat, it is derived from the Greek word "rheos" and "-statis" which means a stream controlling device or a current controlling device. By placing the rheostat in the electrical circuit, we can control (increase or decrease) the flow of electric current in the circuit. Rheostat reduces the electric current flow to certain level. However, it does not completely block's the electric current flow. To completely block the electric current flow, we need infinite resistance. Practically it is not possible to completely block the electric current.



Q5. What is diode?

A diode is a specialized electronic component with two electrodes called the anode and the cathode. Most diodes are made with semiconductor materials such as silicon, germanium, or selenium. ... The fundamental property of a diode is its tendency to conduct electric current in only one direction. The most common function of a diode is to allow an electric current to pass in one direction (called the diode's forward direction), while blocking current in the opposite direction (the reverse direction). Thus, the diode can be viewed as an electronic version of a check valve. the work of the diode is to N-type silicon (red) has extra electrons (black). P-type silicon (blue) has extra holes (white). Battery connected across the p-n junction makes the diode forward biased, pushing electrons from the n-type to the p-type and pushing holes in the opposite direction.



Q6. The importance of Resistors.

The importance, small resistors use coloured painted bands to indicate both their resistive value and their tolerance with the physical size of the resistor indicating its wattage rating. These coloured painted bands produce a system of identification generally known as a Resistors Colour Code.as a simple and quick way of identifying a resistors ohmic value no matter what its size or condition. It consists of a set of individual coloured rings or bands in spectral order representing each digit of the resistors value.

With regards to a 3 band resistor, what is ohmic value for a given resistor;

Q7. Brown Brown Grey

Brown	Brown	Grey
1	1	8

$$11 * 10^8$$

$$11 * 100000000 = 1100\text{M}\Omega \text{ or } 1.1\text{G}\Omega$$

Q8. Blue Green Brown

Blue	Green	Brown
6	5	1

$$65 \times 10^1$$

$$650 = 650\text{K}\Omega \text{ or } 0.65\text{M}\Omega \text{ or } 0.00065\text{G}\Omega.$$

Q9. Black White Red

Black	White	Red
0	9	2

$$09 \times 10^2$$

$$900 = 900\text{K}\Omega \text{ or } 0.9\text{M}\Omega \text{ or } 0.0009\text{G}\Omega$$

Q10. Red Yellow Green

Red	Yellow	Green
2	4	5

$$24 \times 10^5$$

$$24 \times 100000 = 2400000\text{K}\Omega \text{ or } 2400\text{M}\Omega \text{ or } 2.4\text{G}\Omega.$$

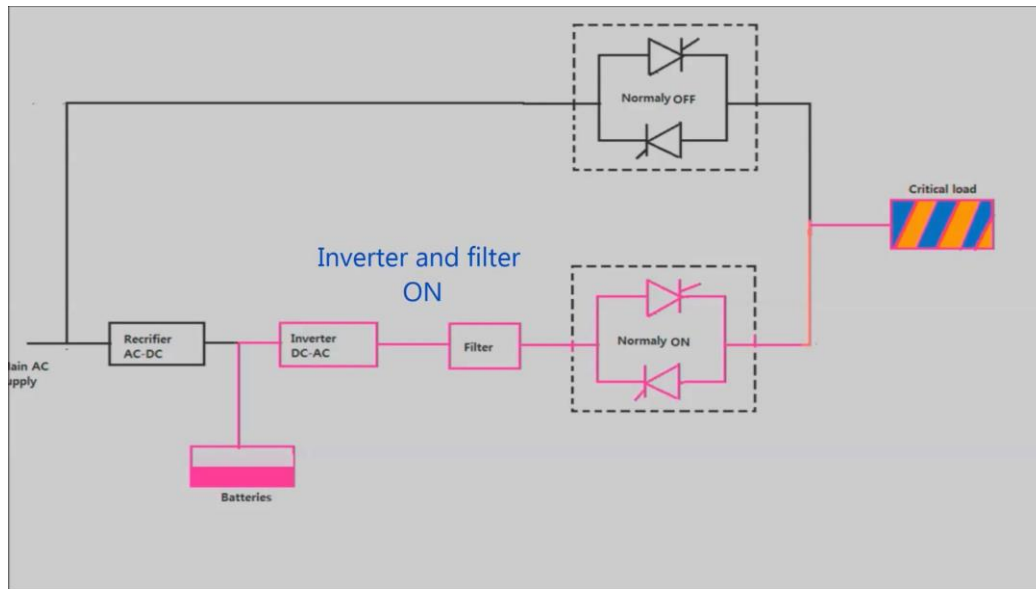
Q11. Describe an Adapter into details how an adapter works taken from AC source 240V AC supply.

An AC adapter, AC/DC adapter, or AC/DC converter is a type of external power supply, often enclosed in a case similar to an AC plug. ... AC adapters are used with electrical devices that require power but do not contain internal components to derive the required voltage and power from mains power. Also called AC adapter, power adapter. a device with a cord that plugs into an electrical outlet and functions as an external power supply for a small or portable electronic device, usually converting AC current to DC. For example;

I forgot to plug in the adapter, and my laptop died. Confirm that the AC power adapter is a genuine HP part and the computer is an HP product. ...

- Plug the DC connector into the power connector on the computer.
- Plug the power cord into the AC adapter.
- Plug the power cord into a working AC wall outlet.

Such power supplies will sometimes employ a transformer to convert the input voltage to a higher or lower AC voltage. A rectifier is used to convert the transformer output voltage to a varying DC voltage, which in turn is passed through an electronic filter to convert it to an unregulated DC voltage.



Q12. Where do we use Capacitors?

Reservoir capacitors are used in power supplies where they smooth the output of a full or half wave rectifier. They can also be used in charge pump circuits as the energy storage element in the generation of higher voltages than the input voltage. Capacitors are components that are used to store an electrical charge and are used in timer circuits. A capacitor may be used with a resistor to produce a timer. Sometimes capacitors are used to smooth a current in a circuit as they can prevent false triggering of other components such as relays. A capacitor (originally known as a condenser) is a passive two-terminal electrical component used to store energy electrostatically in an electric field. ... Unlike a resistor, a capacitor does not dissipate energy. Instead, a capacitor stores energy in the form of an electrostatic field between its plates.

