**IQRA NATIONAL UNIVERSITY**

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**SECTION: A**

**Dept.: BE(C)**

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**Subject: BASIC ELCTRO MECHANICAL**

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Q3: Differentiate between the following?

1. CURRENT AND VOLTAGE;

Current is the rate at which electric charge flows past a point in a circuit. Voltage is the electrical farce that would drive an electric current between two points.

Current versus Voltage

Current is the rate at which electric charge flows past a point in a circuit. In other words, current is the rate of flow of electric charge. Voltage, also called electromotive force, is the potential difference in charge between two points in an electrical field. In other words, voltage is the "energy per unit charge”.

Unit A or amps . V or volts.

Current cannot flow without Voltage.

Voltage is the cause and current is its effect.

Voltage can exist without current.

Measuring Instrument Ammeter AND Voltmeter

SI Unit1 ampere =1 coulomb/second.

1 volt = 1 joule/coulomb.

(V=W/C)Field created A magnetic field An electrostatic field In series connection.

Current is the same through all components connected in series.

Voltage gets distributed over components connected in series.

In a parallel connection. Current gets distributed over components connected in parallel.

Voltages are the same across all components connected in parallel.

B. RESISTANCE AND CONDUCTANCE:

The electrical resistance of an electrical conductor is the opposition to the passage of an electric current through that conductor; the inverse quantity is electrical conductance, the ease at which an electric current passes. Electrical resistance shares some conceptual parallels with the

mechanical notion of friction. The SI unit of electrical resistance is the ohm (Ω), while electrical

conductance is measured in Siemens (S).

An object of uniform cross section has a resistance proportional to its resistivity and length and

inversely proportional to its cross-sectional area. All materials show some resistance, except for

super conductors, which have a resistance of zero.

The resistance (R) of an object is defined as the ratio of voltage across it (V) to current through it

(I), while the conductance (G) is the inverse:

For a wide variety of materials and conditions, V and I are directly proportional to each other,

and therefore R and G are constant (although they can depend on other factors like temperature

or strain). This proportionality is called Ohm's law, and materials that satisfy it are called

"Ohmic" materials.

C.POWER AND ENERGY:

In physics, energy is defined as the amount of work that can be performed by force, whereas power is defined as the rate at which work is performed. Energy is the capacity to do work. Energy is power integrated over time.

Power is the rate at which work is done, or energy is transmitted.

Unit joules = watt-seconds or joule = Newton-meter watt = joules/second Common.

Symbol W $ P

Example. left a 60W light bulb on for 30 days, which raised my electric bill by 43.2 kWh (kilowatt-hours).

My car's battery can provide 500 amps at 12 volts, which equals 6kW of power.

D.INDUCTANCE AND CAPACITANCE

The key difference between inductance and capacitance is that inductance is a property of a current carrying conductor which generates a magnetic field around the conductor whereas capacitance is a property of a device to hold and store electric charges.

E.SYNCHRONOUS AND ASYNCHRONOUS

The Difference Between Synchronous and Asynchronous Motor are explained considering factors like its type, slip, requirement of additional power source, requirement of slip ring and brushes, their cost, efficiency, power factor, current supply, speed, self starting, effect in torque because of change in voltage, their operational speed and various applications of both Synchronous and Asynchronous motor.

Q1:

ANS:





