PHYSICS ASSIGNMENT

TOPIC- POTENIAL DIFFERENCE AND ELECTRIC CURRENT

1.Calculate the number of electrons constituting 16 coulombs of charge'

2, A current of 0.5A is drawn by a filament of an electric bulb for 20 minutes. Find the amount of electric charge that flows through the circuit.

3.20 coulombs of charge flows through any cross section of a conductor in 10 seconds. What is the current flowing through the conductor?

4.If the charge on an electron is 1.6×10^{-19} coulombs, how many electrons should pass through a conductor in 1 second to constitute 1 ampere of current?

5. An amount of 100 joules of work is done in moving a charge of 5 coulombs from one terminal of the battery to another. What is the potential difference of the battery?

6. If 4×10^{-3} joules of work is done in moving a particle carrying a charge of 16×10^{-6} coulombs from infinity to a point P, what will be the potential at point P?

7.How much work is done in moving a charge of 3C across two points having a potential difference of 15V?

8. 40 coulombs of charge is brought from infinity to a given point in an electric field when 60 joules of work is done. What is the potential at that point?

9. A charge of 3C is moved in an electric field from infinity to two points A and B . If the work done in bringing the charge to A is 15J and in bringing to B is 21J , calculate the potential difference between A and B.

10.In the given diagram conductors A and B are connected using mettalic wires. Use it to name/state : a) the conductor at higher potential b) the conductor at lower potential

c)direction of conventional current and d) direction of flow of electrons.
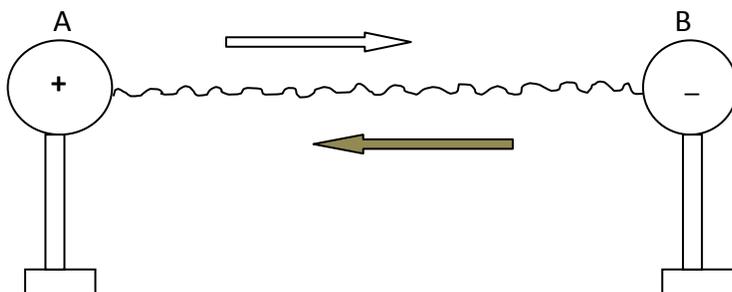
PHYSICS ASSIGNMENT

<u>TOPIC - OHM'S LAW AND RESISTIVITY</u>

1. When a 9V battery is connected across an unknwon resistor ,there is a current of 3mA in the circuit.

Find the value of the resistance of the resistor.

2. How much current will an electric bulb draw from a 220 V source, if the resistance of the bulb filament is 1100 Ω.

3.The potential difference between the terminals of an electric heater is 250V , when it draws a current of 10A. What current will the heater draw , if the potential difference is increased to 300V?

4.How much current will an electric bulb draw from a 220V source, if the resistance of the bulb filament is 660 Ω? How much current will an electric heater coil draw from a220V source if the resistance of the heater is 1000 Ω ?

5. A copper wire of length 3m and area of cross section $1.7×10^{-6}$ m^2 has a resistance of $3×10^{-2}$ Ω. Calculate the resistivity of copper.

6.A 6 Ω resistance wire is doubled on itself. Calculate the new resistance of the wire.

7. Resistance of a metal wire of length 2m is 14 Ω at 20^oC . If the diameter of the wire is 0.6mm what will be the resistivity of the metal at that temperature?

8. A piece of wire is redrawn by pulling it until its length is doubled. Compare the new resistance with the original value.

9. A copper wire has a diameter of 0.6mm and resistivity of $1.7×10^{-8}$ Ωm.

a) What will be the length of this wireto make its resistance 17 Ω.

b) How much does the resistance changeif the diameter is doubled?

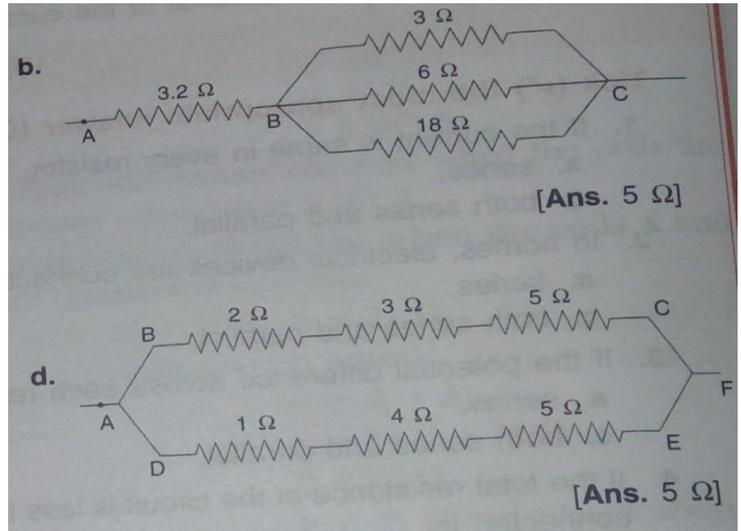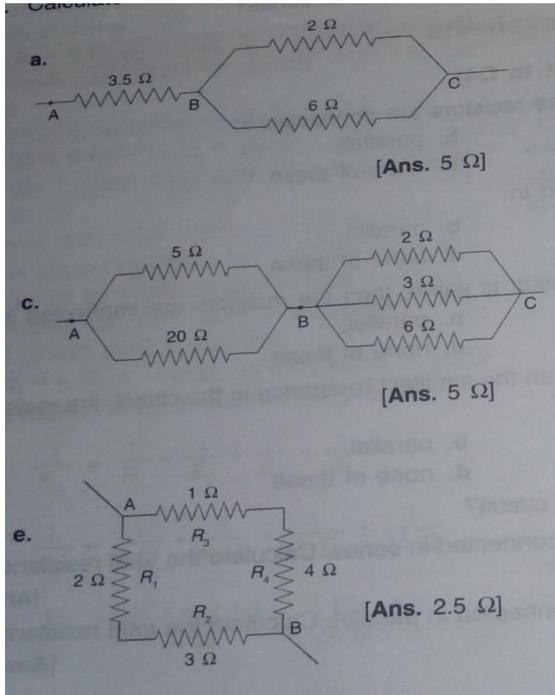c) How much does the resistance changeif the diameter is halved?

PHYSICS ASSIGNMENT

TOPIC- COMBINATION OF RESISTANCES

1.Calculate the total resistance of the circuit in the following diagrams:

a.

$2\ \Omega$

$3.5\ \Omega$

$6\ \Omega$

[Ans. 5 Ω]

b.

$3\ \Omega$

$6\ \Omega$

$3.2\ \Omega$

$18\ \Omega$

[Ans. 5 Ω]

c.

$5\ \Omega$

$2\ \Omega$

$3\ \Omega$

$20\ \Omega$

$6\ \Omega$

[Ans. 5 Ω]

d.

$2\ \Omega$ $3\ \Omega$ $5\ \Omega$

$1\ \Omega$ $4\ \Omega$ $5\ \Omega$

[Ans. 5 Ω]

e.

$1\ \Omega$ R_3

$2\ \Omega$ R_1 R_4 $4\ \Omega$

R_2

$3\ \Omega$

[Ans. 2.5 Ω]

2.In the circuit diagram given below calculate:

a) current through each resistor   b)total current in the circuit   c)total circuit resistance

$2\ \Omega$

R_1
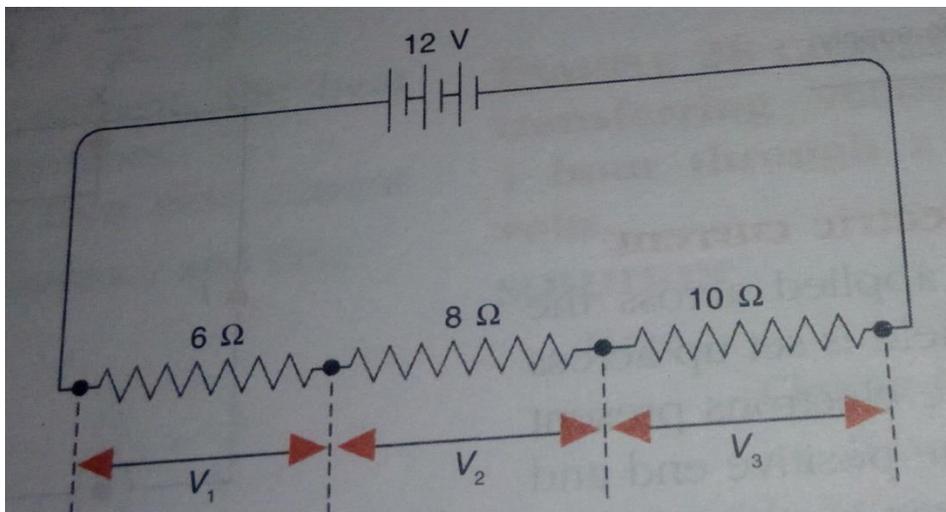
$4\ \Omega$

R_2

$8\ \Omega$

R_3

V

16 V

A
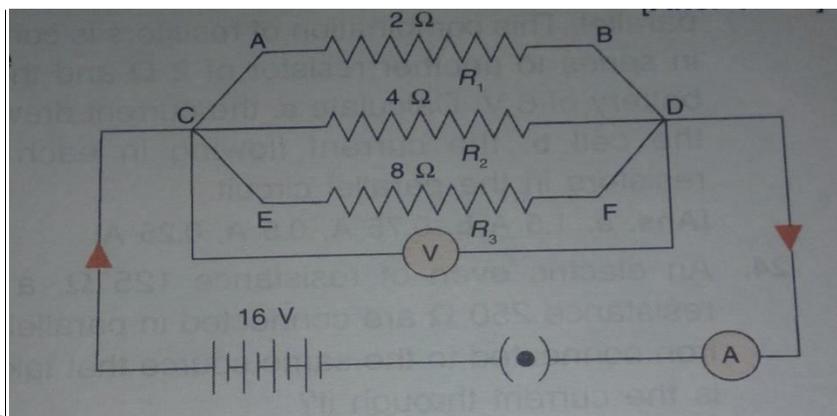
3. In the circuit diagram given below calculate:

a)total circuit resistance.

b)total current in the circuit
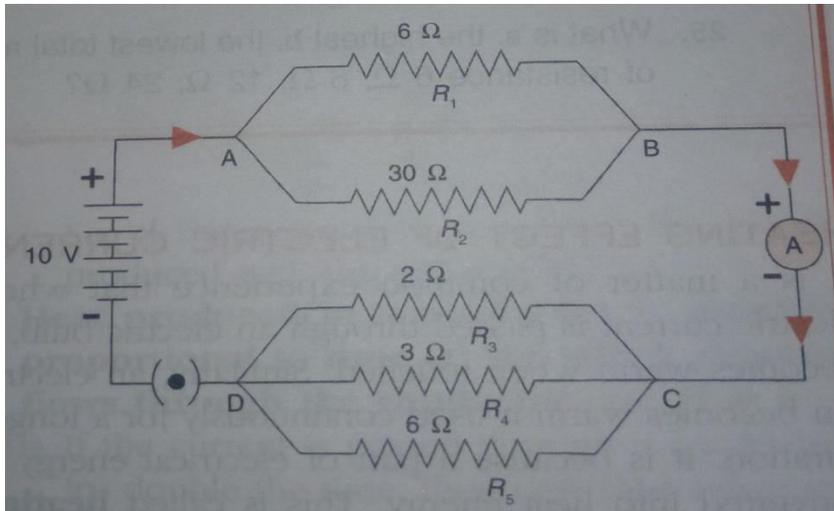
4. . In the circuit diagram given below, three resistors 6 Ω ,8 Ω and 10 Ω respectively are connected in seriesto a battery of 12 V . Calculate a) the current drawn from the battery b) the potential difference at the ends of each.

5. Show how you would connect three resistors each of resistance 5 Ω so that the combination has a resistance of a) 7.5 Ω   b) 3.33 Ω .

6. A hot plate of electric oven connected to 220V line has two resistance coils A and B each of 22 Ω resistance which may be used seperately , in series or in parallel. What are the currents in each case?

7. .In the circuit diagram given below calculate:

a)current drawn from the cell

b) current through each resistor in parallel combination.