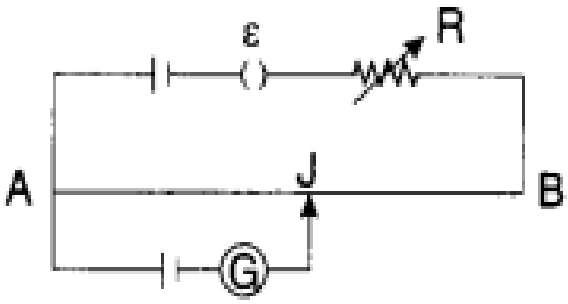
NIOS/Acad./2021/312/17/E

National Institute of Open Schooling
Senior Secondary
Lesson 17-ELECTRIC CURRENT
WORKSHEET – 17

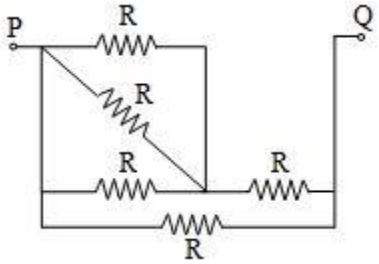
Q1. A cell having an emf E and internal resistance r is connected across a variable external resistance R. As the resistance R is increased, plot the graph of potential difference V across R.

Q2. In a Wheatstone bridge if the battery and galvanometer are interchanged then comment upon the deflection in galvanometer.



Q3. A steel wire is stretched to make it 0.2% longer. What is the percentage change in its resistance and resistivity?

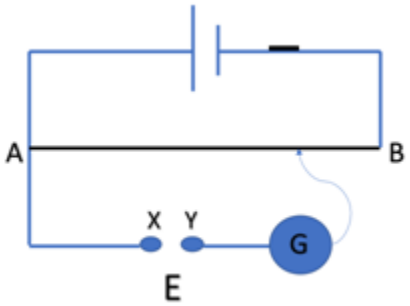
Q4. The equivalent resistance between the terminal point P and Q is 4Ω in the given circuit. Find out the resistance of R in ohms.



Q5. Two conducting wires P and Q are having same diameter but made up of different materials. Both the wires are joined in series across a battery. If the number density of electrons in P is 3 times than in Q, find the ratio of drift velocity of electrons in the two wires.

Q6. Two conducting wires X and Y of same diameter but different materials are joined in series to form a battery. If the number density of electrons in X is twice that in Y, find the ratio of drift velocity of electrons in the two wires. Explain if they are connected in parallel?

Q6. For the potentiometer circuit shown in the given figure point X and Y represent the two terminals of a cell of an unknown e.m.f. E.A student observed that when the jockey is moved from end A to end B of the potentiometer wire, the deflection in the galvanometer remains in the same direction.



a) What are two possible faults in the circuit that could result in this observation?

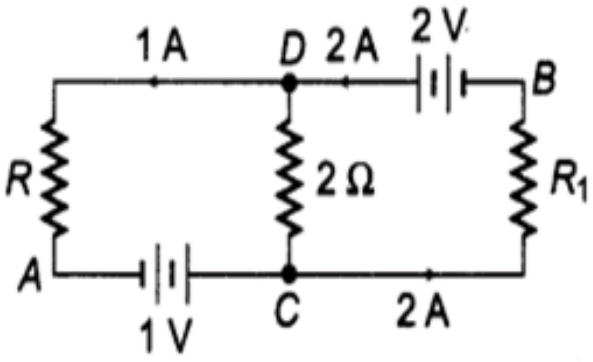
b) If the galvanometer deflection at the end B is

i) More than at end A

ii) Less than at end A,

Which of the two faults, listed above, would be there in the circuit? Give reasons in support of your answer in each case.

Q8. In the given circuit, assuming point A to be at zero potential, use Kirchhoff's rules to determine the potential at point B



Q9. Two tungsten filaments with resistance R_1 and R_2 respectively are connected first in series and then in parallel in a lighting circuit of negligible internal resistance.If $R_1 >> R_2$ answer the following questions –

a) Which lamp will glow more brightly when they are connected in series?

b) If the lamp of résistance R_2 now burns out and the lamp R_1 alone is plugged in; will net illumination increase or decrease?

c) Which lamp will glow more brightly when they are connected in parallel?

d) If the lamp of resistance R_1 now burns out, how will the net illumination produced change?

Q10. At the temperature 0^0C, the electric resistance of conductor B is n times that of conductor A. Their temperature coefficients of resistance are equal to α_2 and α_1 respectively. Find the resistance and temperature coefficients of a resistance of a circuit segment consisting of these two conductors when they are connected in series.