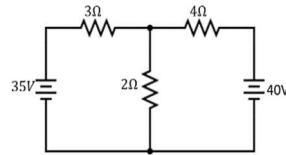1. Kirchhoff's law in electricity is very useful in solving the complicated circuit connections,
   a) What are the two basic Kirchhoff's laws?
   b) Using Kirchhoff's law of current and voltage, find the current through 2Ω resistor in the given circuit.   [3]

2. Kirchhoff's law in electricity is very useful in solving the complicated circuit connections,
   a) State and explain Kirchhoff's first law.
   b) What must be the emf E in the circuit so that the current flowing through the 7 Ω resistor is 1.80A? (Ans: 8.6V)
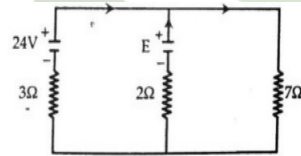
3. Kirchhoff's laws are used in solving complex electrical circuit.
   a) Kirchhoff's laws are applicable to DC circuit. Is it applicable to AC circuit?
   b) Using Kirchhoff's law in electrical circuits, find,

   i.   The current in resistor R
   ii. The unknown emf E
   iii. The resistance R
   iv. If the circuit is broken at P, what is the current in resistor R. [Ans: 2A, 42V, 5 Ω, 3.5A]
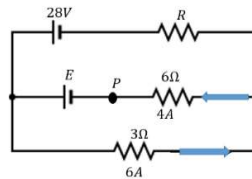
4. Wheatstone bridge is a good engineering of circuit designing. It has several uses and sometimes it shows problems in measuring resistance.   [2+2+1]
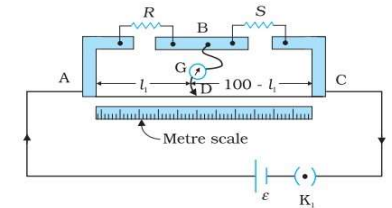   a) Write the balance condition Wheatstone bridge along with circuit diagram.
   b) Can we measure the internal resistance of a car battery with the help of Wheatstone bridge?
   c) Under what condition, Wheatstone bridge work perfectly.

5. Meter Bridge is usually used to determine the resistance of a wire segment and the comparison of two resistors.   [1+3+1]
   a) On what principle does it work?
   b) In a meter bridge when the resistance in the left gap is 3Ω and an unknown resistance in the right gap, the balance point is obtained at 40 cm from the zero end. Find the value of unknown resistance. On shunting the unknown resistance with 2Ω, find the shift of the balance point on the bridge wire.
   c) What happens if the meter bridge wire is made with copper wire?

6. a) In a meter bridge, the balance point is found to be at 39.5 cm from the end A, when the resistor S is of 12.5 Ω. Determine the resistance of R. Why are the connections between resistors in a Wheatstone or meter bridge made of thick copper strips?   [2]
   b) Determine the balance point of the bridge above if R and S are interchanged.
   c) What happens if the galvanometer and cell are interchanged at the balance point of the bridge?   [1]

7. a) State the principle of the Potentiometer. A potentiometer is also called a voltmeter of infinite resistance, why?   [NEB 2080 (Model)]
   (b) In the meter bridge experiment, the balance point was observed at J with l=20cm.
   (i) The values of R and X were doubled and then interchanged. What would be the new position of balance point?
   (ii) If the galvanometer and battery are interchanged at the balance position, how will the balance point get affected?
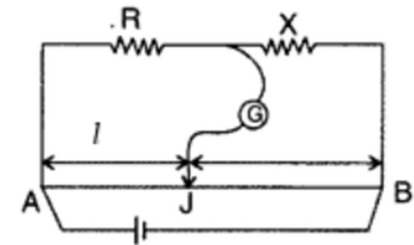
8. (a) State the two Kirchhoff's laws for electrical circuits. [NEB 2080 (Model)]
   (b) In Meter Bridge shown below, the null point is found at a distance of 60.0 cm from A. If now a resistance of 5Ω is connected in series with S, the null point occurs at 50 cm. Determine the values of R and S.