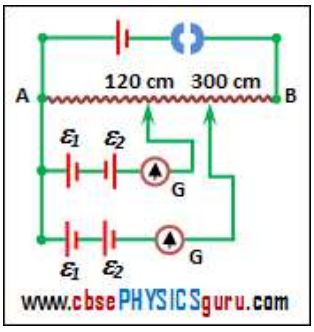
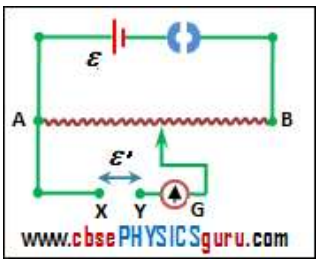
Questions- Potentiometer

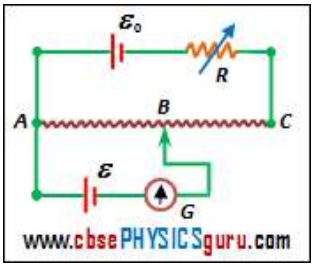
1. *In the figure, a long uniform potentiometer wire AB is having a constant potential gradient along its length. The null points for the two primary cells of emf ε_1 and ε_2 ($\varepsilon_1 > \varepsilon_2$) connected to the potentiometer wire AB as shown in the figure are obtained at a distance of 120 cm and 300 cm from the end A. Find (i)$\varepsilon_1/\varepsilon_2$ and (ii) position of null point forε_1 alone.*



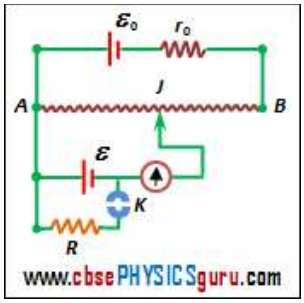
2. *For the potentiometer circuit shown in the figure, points X and Y represent the two terminals of an unknown emf ε'. A student observed that when the jockey is moved from the end A to the end B of the potentiometer wire, the deflection in the galvanometer remains in the same direction. What may the two faults in the circuit that could result in this observation? If the galvanometer deflection at the end B is (i) more, (ii) less, than that at the end A, which of the two faults, listed above, would there be in the circuit?*



3. *A potentiometer used to measure the emf of a cellε, is shown in the figure. AC is the potentiometer wire of length 100 cm and resistance 5 ohm. The emf of a standard cell ε_0 is 6volt and rheostat R is adjusted to 5 ohm. If the null point is obtained at B with AB = 60 cm, what is the emf of cellε?*



4. *Potentiometer shown in the figure is used to measure the internal resistance of a cell. (i) When key K is open, how does the balance point change, if current from the driver cell decreases? (ii) When the key is closed, how does the balance point change if R is increased, keeping the current from the driver cell constant?*



5. The potentiometer circuit shown, the balance (null) point is at C. State with reason, where the balance point will be shifted when (1) Resistance R is increased, keeping all parameters unchanged. (2) Resistance S is increased, keeping R constant. (3) Cell X is replaced by another cell whose emf is lower than that of cell Y.