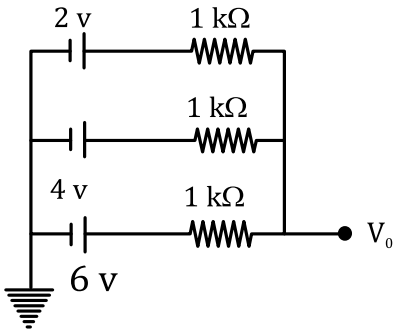
DPP -2

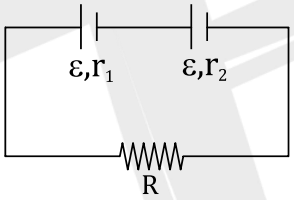
1. In the given figure, the value of V_0 will be ___ V.



2. Two sources of equal emfs are connected in series. This combination is connected to an external resistance R. The internal resistance of the two sources are r_1 and $r_2 (r_1 > r_2)$. If the potential difference across the source of internal resistance r_1 is zero, then the value of R will be

(A) $r_1 - r_2$ (B) $\frac{r_1 r_2}{r_1 + r_2}$ (C) $\frac{r_1 + r_2}{2}$ (D) $r_2 - r_1$

3. Two batteries having same emf ε but having different internal resistances r_1 and $r_2 (< r_1)$ are connected in series to an external resistance R as shown in figure. For this situation mark out the correct statement(s).



(A) Only one value of R exist for which potential difference across battery having internal resistance r_1 is zero.

(B) Only one value of R exist for which potential difference across battery having internal resistance r_2 is zero.

(C) No value of R exist for which potential difference across any of the battery is zero.

(D) For all value of R potential difference across both the batteries would be zero.

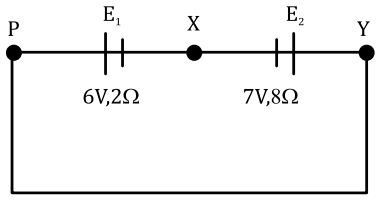
4. In order to determine the e.m.f. of a storage battery it was connected in series with a standard cell in certain circuit and a current I_1 was obtained. When the battery is connected to the same circuit opposite to the standard cell a current I_2 flow in the external circuit from the positive pole of the storage battery was obtained. What is the e.m.f. of the storage battery? The e.m.f., of the standard cell is ε_2.

(A) $\varepsilon_1 = \frac{I_1 + I_2}{I_1 - I_2}\varepsilon_2$ (B) $\varepsilon_1 = \frac{I_1 + I_2}{I_2 - I_1}\varepsilon_2$ (C) $\varepsilon_1 = \frac{I_1 - I_2}{I_1 + I_2}\varepsilon_2$ (D) $\varepsilon_1 = \frac{I_2 - I_1}{I_1 + I_2}\varepsilon_2$

5. Five identical cells each of internal resistance 1Ω and emf 5 V are connected in series and in parallel with an external resistance ' R '. For what value ' R ', current in series and parallel combination will remain the same?

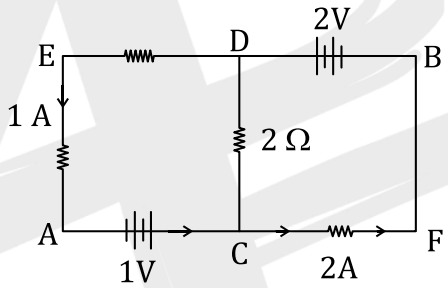
(A) 1Ω (B) 5Ω (C) 25Ω (D) 10Ω

6. A cell E_1 of emf 6 V and internal resistance 2Ω is connected with another cell E_2 of emf 4 V and internal resistance 8Ω (as shown in the figure). The potential difference across points X and Y is



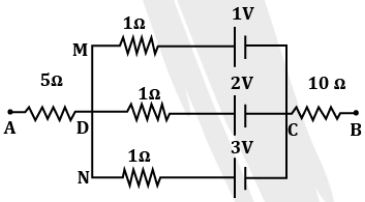
(A) 10.0 V (B) 5.6 V (C) 3.6 V (D) 2.0 V

7. In the circuit, given in the figure currents in different branches and value of one resistor are shown. Then potential at point B with respect to the point A is



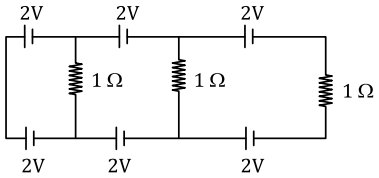
(A) +2 V (B) −2 V (C) −1 V (D) +1 V

8. In the circuit shown, the potential difference between A and B is



(A) 6 V (B) 3 V (C) 2 V (D) 1 V

9. In the above circuit the current in each resistance is



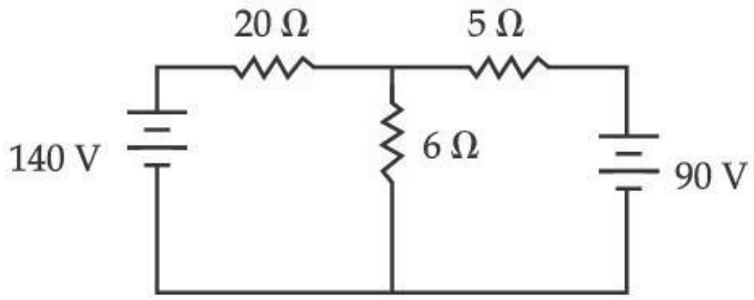
(A) 1 A

(B) 0.25 A

(C) 0.5 A

(D) 0 A

10. The value of current in the 6Ω resistance is



(A) 8 A (B) 6 A (C) 4 A (D) 10 A

ANSWER KEY

1. 4 Volt **2.** (A) **3.** (A) **4.** (A) **5.** (A) **6.** (B) **7.** (D)
8. (C) **9.** (D) **10.** (D)