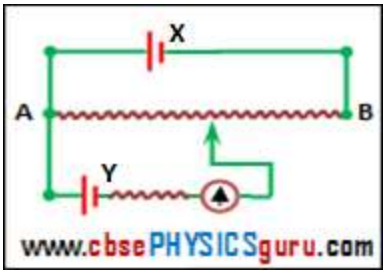
METER BRIDGE AND POTENTIOMETER

1. Two resistances are connected in two gaps of meter-bridge. The balance point is 20 cm from the zero end. A resistance of 15 Ω is connected in series with the smaller of the two. The null point shifts to 40 cm. The value of the smaller resistance in ohm is:
   (a) 3 (b) 6 **(c)** 9 (d) 12
2. Resistors X and Y connected in the gaps of the meter-bridge. The balancing point is obtained 1/3 m from the zero end. If a 6 Ω resistance is connected in series with X, the balance point shifts to 2/3 m from same end. X and Y are:
   (a) 4, 2 **(b)** 2, 4 (c) 3, 5 (d) 3, 6
3. A resistance of 2 Ω is connected across the gap of a meter-bridge and an unknown resistance, greater than 2 Ω, is connected across the other gap. When these resistances are interchanged, the balance point shifts by 20 cm. Neglecting any correction, the unknown resistance is:
   (a) 3 Ω (b) 4 Ω (c) 5 Ω (d) 6 Ω
4. The percentage error in measuring resistance with a meter-bridge can be minimized by adjusting the balancing point close to:
   (a) 0 cm (b) 20 cm **(c)** 50 cm (d) 100 cm
5. A meter bridge is balanced with a 20 Ω resistance in the left gap and 30 Ω in the right gap. If the 20 Ω resistance is now shunted by another 20 Ω resistance, the shift in the null point is:
   (a) 15 m towards right (b) 25 m towards left (c) 15 m towards right **(d)** 15 m towards left
6. A potentiometer wire of length 200 cm has a resistance of 20 Ω. It is connected in series with a resistance 10 Ω and a battery of emf 6 V having negligible internal resistance. A source of 2.4 V is balanced a length L of the potentiometer wire. The value of L is:
   (a) 100 cm **(b)** 120 cm (c) 110 cm (d) 140 cm.
7. A potentiometer wire of length 100 cm has a resistance of 10 ohm. It is connected in series with a resistance and a cell of emf 2 volt and of negligible internal resistance. A source of emf 10 mV is balanced against a length 40 cm of the potentiometer wire. The value of external resistance is:
   (a) 790 Ω (b) 890 Ω (c) 990 Ω (d) 1050 Ω
8. The potential gradient along the length of a uniform wire is 10 volt per metre. B and C are two points at 30 cm and 70 cm on a metre scale along the wire: The potential difference between B and C will be:
   (a) 3 volt **(b)** 4 volt (c) 7 volt (d) 4 volt.
9. Figure shows a potentiometer using a cell X of 2 V and internal resistance 0.5 Ω connected to a wire AB. A standard cell Y of a constant emf of 1.02 V gives a balance point at 51 cm of the wire. When Y is replaced by a cell of emf ε, the balance point is obtained 75 cm. The value of ε is:
   (a) 1.25 V **(b)** 1.5 V (c) 1.75 V (d) 2.0 V



10. A potentiometer wire, 10 m long, has a resistance of 40 Ω. It is connected in series with a resistance box and 2 V storage cell. If the potential gradient along the wire is 0.1 mV/cm, the resistance unplugged in the box is:
    (a) 260 Ω (b) 860 Ω (c) 860 Ω **(d)** 760 Ω
11. In a potentiometer experiment, the balancing with a cell is at length 240 cm. On shunting the cell with a resistance of 2 Ω, the balancing length becomes 120 cm. The internal resistance of the cell is:

(a) 2 Ω (b) 4 Ω (c) 0.5 Ω (d) 1 Ω

12. A potentiometer has uniform potential gradient. The specific resistance of the material of the potentiometer wire is 10^{-7} Ω m and the current passing through it is 0.1 A, cross section of the wire is 10^{-6} m^2. The potential gradient along the potentiometer wire is:
    (a) 10^{-4} V/m (b) 10^{-6} V/m **(c)** 10^{-2} V/m (d) 10^{-8} V/m
13. In a potentiometer experiment, when three cells A, B and C are connected in series the balancing length is found to be 740 cm. If A and B are connected in series balancing length is 440 cm and for B and C connected in series that is 540 cm. Then the emf of ε_A, ε_B and ε_C are respectively (in volts):
    (a) 1.0, 1.2 and 1.5 (b) 1.0, 2.0 and 3.0 (c) 1.5, 2.0 and 3.0 (d) 1.5, 2.5 and 3.5
14. In an experiment with potentiometer, a cell of emf 1.25 V gives a balance point at 35 cm length of the wire. If the cell is replaced by another cell, the balance point shift to 63 cm. The emf of the second cell is:
    (a) 3.25 V (b) 2.5 V **(c)** 2.25 V (d) 2 V
15. The accurate measurement of emf can be obtained using:
    (a) multimeter (b) voltmeter (c) voltameter **(d)** potentiometer