

Physics Point
For **XII XI X** By- Rajesh Sir
JEE NEET
733 0000 123

Physics Point

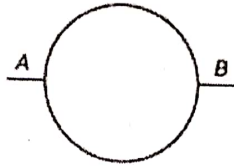
1. Manganin or Eureka is used for making standard resistance coils. Why?
2. A potentiometer of longer wire is more sensitive. Explain.
3. Why do we prefer potentiometer to measure the e.m.f. of a cell rather than a voltmeter?
4. Why are the connections between resistors in a Wheatstone or meter bridge made of thick copper strips?
5. A 60 W bulb connected in parallel with a room heater is further connected across the mains. If 60 W bulb is now replaced by a 100 W bulb, will heat produced by heater be smaller, remain the same or be larger? Explain why?
6. Two wires, one of copper and the other of manganin, have equal lengths and equal resistances. Which wire is thicker?
7. A potential difference V exists across a copper wire of length l and diameter d . How will the drift velocity be affected if V is doubled, (ii) l is doubled and (iii) d is doubled.
8. A potential difference V is applied to the conductor of the length l and radius r . How are the electric field E , the drift velocity and the resistance affected as Potential difference V is doubled (i) length l is doubled and (iii) the radius r is doubled.
9. How does the balancing point of a Wheatstone bridge get affected
 - (i) Position of cell and Galvanometer are interchanged?
 - (ii) Position of the known and unknown resistances is interchanged?
10. Two bulbs are marked 220V-100W and 220V-50W. They are connected in series to 220V mains. Find the ratio of heat generated in them.
11. A cell of emf E and internal resistance r is connected to two external resistances R_1 and R_2 and a parallel ammeter. The current in the circuit is measured in four different situations:
 - (a) without any external resistance in the circuit
 - (b) with R_1 only
 - (c) with R_1 and R_2 in series combination
 - (d) with R_1 and R_2 in parallel combination

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The currents in the four cases are 0.42A, 1.05A, 4.2A and 1.4A, but not necessarily in that order.

Identify the currents corresponding to the four cases mentioned above.

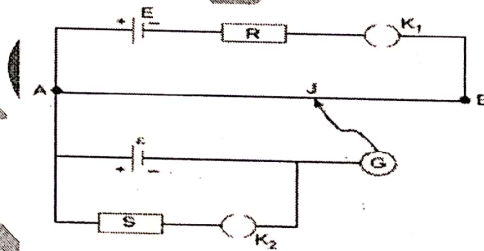
12. A wire of resistance $8R$ is bent in the form of a circle. What is the effective resistance between the ends of a diameter AB ?



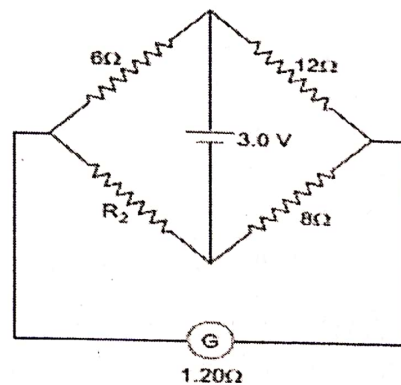
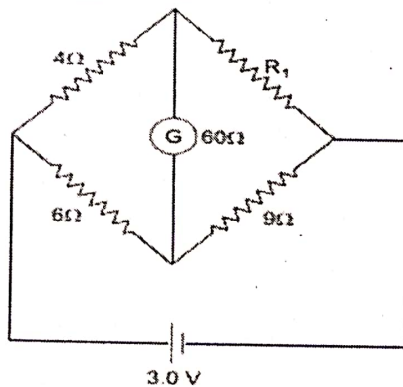
13. Two students 'X' and 'Y' perform an experiment on potentiometer separately using the circuit given:

Keeping other parameters unchanged, how will the position of the null point be affected if

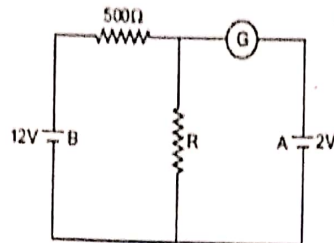
- (i) 'X' increases the value of resistance R in the set-up by keeping the key K_1 closed and the key K_2 open?
 (ii) 'Y' decreases the value of resistance S in the set-up, while the key K_2 remain open and the key K_1 closed? Justify



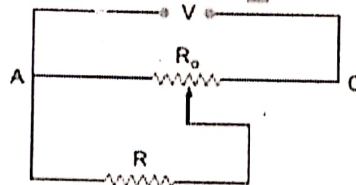
14. Figure shows two circuits each having a galvanometer and a battery of 3 V. When the galvanometers in each arrangement do not show any deflection, obtain the ratio R_1 / R_2 .



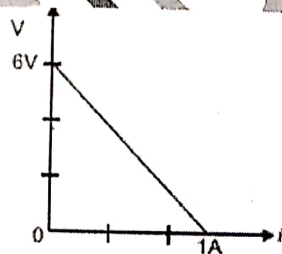
15. In the circuit shown in the figure, the galvanometer 'G' gives zero deflection. If the batteries A and B have negligible internal resistance, find the value of the resistor R.



16. A resistance of R Ohm draws current from a potentiometer as shown in the figure. The potentiometer has a total resistance R_0 Ohm. A voltage V is supplied to the potentiometer. Derive an expression for the voltage across R when the sliding contact is in the middle of the potentiometer.



17. The plot of the variation of potential difference across a combination of three identical cells in series, versus current is as shown below. What is the emf of each cell ?



18. A potentiometer wire of length 1 m is connected to a driver cell of emf 3 V as shown in the figure. When a cell of 1.5 V emf is used in the secondary circuit, the balance point is found to

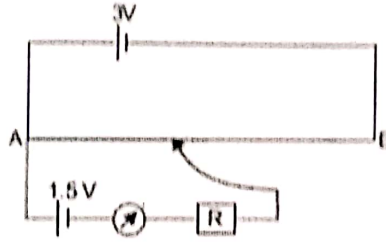
be 60 cm. On replacing this cell and using a cell of unknown emf, the balance point shifts to 80 cm.

(i) Calculate unknown emf of the cell.

(ii) Explain with reason, whether the circuit works, if the driver cell is replaced with a cell of emf

1 V.

(iii) Does the high resistance R , used in the secondary circuit affect the balance point? Justify your answer.



19. A resistance $R = 5 \text{ ohm}$ is connected to one of the gaps in a metre bridge, which uses a wire of length 1 m. An unknown resistance $X > 5 \text{ ohm}$ is connected in the other gap as shown in the figure. The balance point is noticed at $l \text{ cm}$ from the positive end of the battery. On interchanging R and X , it was found that the balance point further shifts by 20 cm away from end A. Neglecting the end correction, calculate the value of unknown resistance X used.

