

# O P JINDAL SCHOOL, SAVITRINAGAR

## PRACTICE PAPER

CLASS XII PHYSICS

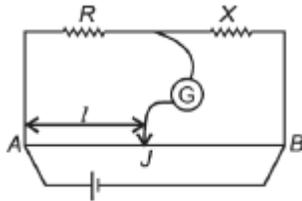
TOPIC : CURRENT ELECTRICITY

Date : 05/05/20

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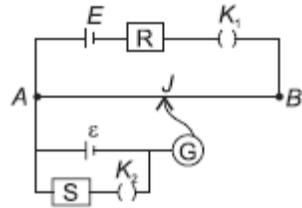
1 In the meter bridge experiment, balance point was observed at  $J$  with  $AJ = l$ .

- (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?



2

2 Two students  $X$  and  $Y$  perform an experiment on potentiometer separately using the circuit given below.



2

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  $K_2$  remains open and the key  $K_1$  closed.

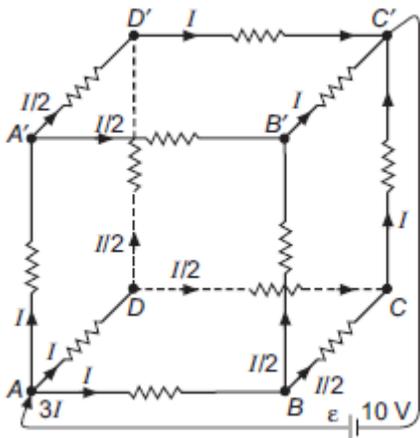
3 Wheatstone bridge method is considered unsuitable for the measurement of very low resistances. Why?

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4 (a) State the Kirchoff 's law.

- (b) A battery of 10V and negligible internal resistance is connected across the diagonally opposite corners of a cubical network consisting of 12 resistors each of resistance  $1\Omega$  in figure. Determine the equivalent resistance of the network and the current along each edge of the cube.

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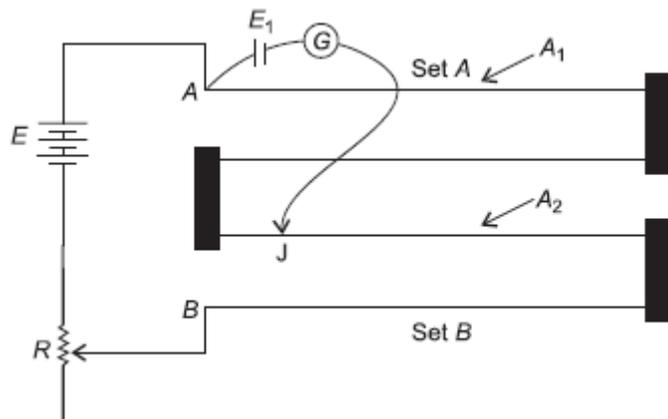
5 You are given two sets of potentiometer circuit to measure the emf  $E_1$  of a cell.

Set A: consists of a potentiometer wire of a material of resistivity  $\rho_1$ , area of cross-section  $A_1$  and length  $l$ .

Set B: consists of a potentiometer of two composite wires of equal lengths  $l/2$  each, of resistivity  $\rho_1, \rho_2$  and area of cross-section  $A_1, A_2$  respectively.

(i) Find the relation between resistivity of the two wires with respect to their area of cross-section, if the current flowing in the two sets is same.

(ii) Compare the balancing length obtained in the two sets.



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6 (a) State the principle of working of a potentiometer.

(b) Figure shows the circuit diagram of a potentiometer for determining the emf  $\epsilon$  of a cell of negligible internal resistance.

(i) What is the purpose of using high resistance  $R_2$ ?

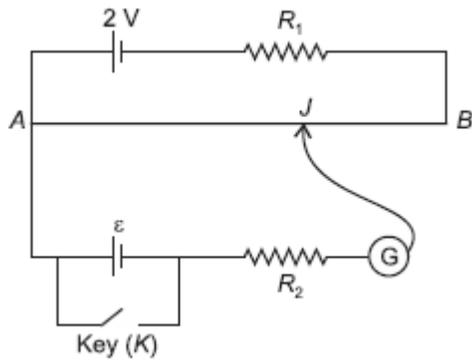
(ii) How does the position of balance point ( $J$ ) change when the resistance  $R_1$  is decreased?

(iii) Why cannot the balance point be obtained

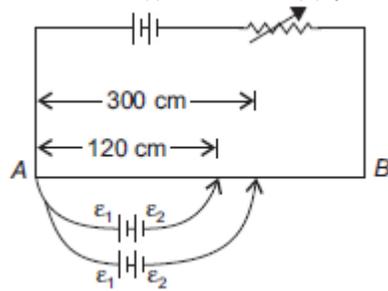
(1) When the emf  $\epsilon$  is greater than 2 V, and

(2) When the key ( $K$ ) is closed?

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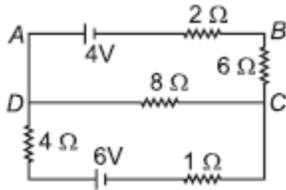


- 7 (a) State the principle of potentiometer. Define potential gradient. Obtain an expression for potential gradient in terms of resistivity of the potentiometer wire.
- (b) Figure shows a long potentiometer wire  $AB$  having a constant potential gradient. The null points for the two primary cells of emfs  $\epsilon_1$  and  $\epsilon_2$  connected in the manner shown are obtained at a distance of  $l_1 = 120$  cm and  $l_2 = 300$  cm from the end  $A$ . Determine (i)  $\epsilon_1/\epsilon_2$  and (ii) position of null point for the cell  $\epsilon_1$  only.



5

- 8 State Kirchhoff's laws of an electrical network. Using Kirchhoff's laws, calculate the potential difference across the  $8\ \Omega$  resistor.



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