

O P JINDAL SCHOOL, SAVITRINAGAR

PRACTICE PAPER

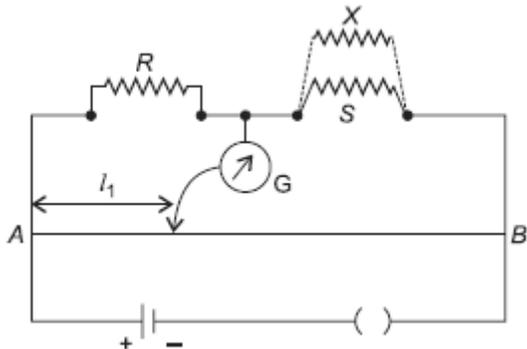
CLASS XII PHYSICS

TOPIC : CURRENT ELECTRICITY

Date : 02/05/20

MM :25

- 1 (a) You are required to select a carbon resistor of resistance $47 \text{ kW} \pm 10\%$ from a large collection. What should be the sequence of colour bands used to code it ? 2
(b) Write two characteristics of manganin which make it suitable for making standard resistances.
- 2 A cell of emf E and internal resistance r is connected to two external resistances R_1 and R_2 and a perfect ammeter. The current in the circuit is measured in four different situations : 2
(i) without any external resistance in the circuit,
(ii) with resistance R_1 only,
(iii) with R_1 and R_2 in series combination, and
(iv) with R_1 and R_2 in parallel combination.
The currents measured in the four cases are 4.2 A, 1.05 A, 0.42 A, 1.4 A but not necessarily in that order. Identify the currents corresponding to the four cases mentioned above.
- 3 State the two Kirchhoff 's rules used in electric networks. How are these rules justified? 2
- 4 (i) State the principle of working of a meter bridge.
(ii) In a meter bridge balance point is found at a distance l_1 with resistances R and S as shown in the figure. When an unknown resistance X is connected in parallel with the resistance S , the balance point shifts to a distance l_2 . Find the expression for X in terms of l_1 , l_2 and S .



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5 State the underlying principle of a potentiometer.

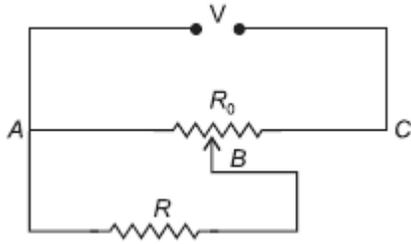
Describe briefly, giving the necessary circuit diagram, how a potentiometer is used to measure the internal resistance of a given cell.

6 A resistance of $R \Omega$ draws current from a potentiometer as shown in the figure.

The potentiometer has a total resistance $R_0 \Omega$.

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.



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7 (a) State, with the help of circuit diagram, the working principle of a meter bridge. Obtain the expression used for determining the unknown resistance.

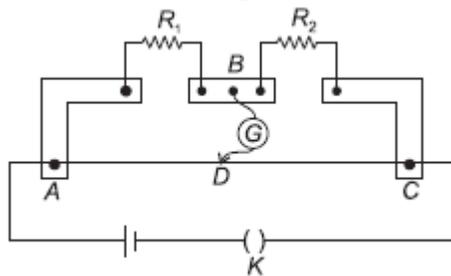
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(b) What happens if the galvanometer and cell are interchanged at the balance point of the bridge ?

(c) Why is it considered important to obtain the balance point near the midpoint of the wire?

8 (a) State Kirchhoff's rules for a network. Using Kirchhoff's rules, obtain the balance condition in terms of the resistances of four arms of wheatstone bridge.

(b) In the meter bridge experimental set up, shown in the figure, the null point D is obtained at a distance of 40 cm from end A of the meter bridge wire. If a resistance of 10Ω is connected in series with R_1 , null point is obtained at $AD = 60$ cm. Calculate the values of R_1 and R_2 .



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