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PRACTICE PAPER

CLASS XII PHYSICS **TOPIC : CURRENT ELECTRICITY**

Date : 30/04/20 **MM :25**

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1 Why is the potentiometer preferred to a voltmeter for measuring emf of a cell? 1

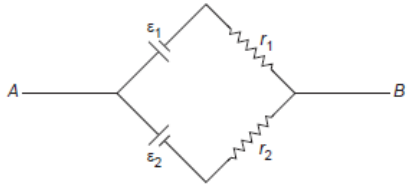
2 Why copper is not used for making potentiometer wires? 1

3 The emf of a cell is always greater than its terminal voltage. Why? Give reason. 1

4 How can we increase the sensitivity of a potentiometer? 1

5 Why do bends in a wire not affect its resistance? 1

6 Two batteries of ε_1 and ε_2 ($\varepsilon_2 > \varepsilon_1$) and internal resistance r_1 and r_2 respectively are connected in parallel as shown in figure.



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(a) The equivalent emf ε_{eq} of the two cells is between ε_1 and ε_2, i.e. $\varepsilon_1 < \varepsilon_{eq} < \varepsilon_2$.
(b) The equivalent emf ε_{eq} is smaller than ε_1.
(c) The ε_{eq} is given by $\varepsilon_{eq} = \varepsilon_1 + \varepsilon_2$ always.
(a) ε_{eq} is independent of internal resistances r_1 and r_2.

7 A resistance R is to be measured using a meter bridge. Student chooses the standard resistance S to be 100 Ω He finds the null point at l_1 = 2.9 cm. He is told to attempt to improve the accuracy. Which of the following is a useful way?
(a) He should measure l1 more accurately.
(b) He should change S to 1000 Ω and repeat the experiment.
(c) He should change S to 3 Ω and repeat the experiment.
(d) He should give up hope of a more accurate measurement with a meter bridge. 1

8 Two cells of emf's approximately 5 V and 10 V are to be accurately compared using a potentiometer of length 400 cm. [NCERT Exemplar]

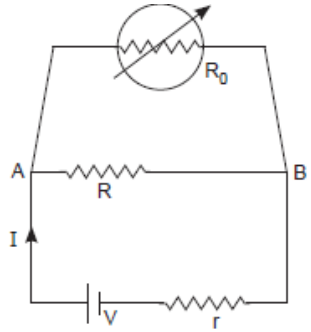
(a) The battery that runs the potentiometer should have voltage of 8 V.

(b) The battery of potentiometer can have a voltage of 15 V and R adjusted so that the potential drop across the wire slightly exceeds 10 V. 1

(c) The first portion of 50 cm of wire itself should have a potential drop of 10 V.

(d) Potentiometer is usually used for comparing resistances and not voltages.

9 Consider a simple circuit shown in figure stands for a variable resistance R′. R′ can vary from R_0 to infinity. r is internal resistance of the battery ($r << R << R_0$). 1



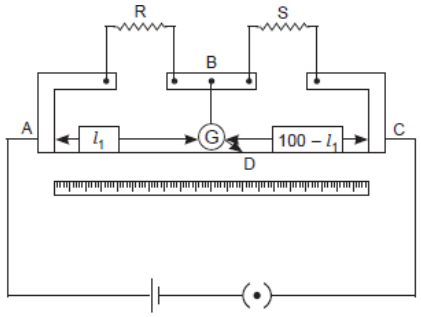
(a) Potential drop across AB is not constant as R0 is varied.

(b) Current through R0 is nearly a constant as R0 is varied.

(c) Current I depends sensitively on R0.

(d) $I \geq \frac{V}{r+R}$ always.

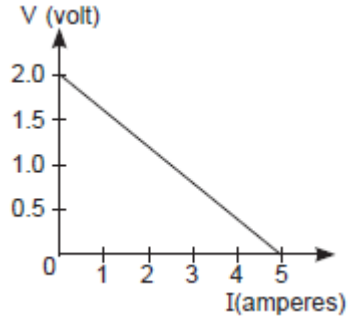
10 In a meter bridge, the point D is a neutral point (figure). 1



(a) The meter bridge can have other neutral point for this set of resistances.
(b) When the jockey contacts a point on meter wire left of D, current flows to B from the wire.
(c) When the jockey contacts a point on the meter wire to the right of D, current flows from B to the wire through galvanometer.
(d) When R is increased, the neutral point shifts to left.

11 For measurement of potential difference, a potentiometer is preferred over voltmeter because
(a) potentiometer is more sensitive than voltmeter.
(b) the resistance of potentiometer is less than voltmeter. 1
(c) potentiometer is cheaper than voltmeter.
(d) potentiometer does not take current from the circuit.

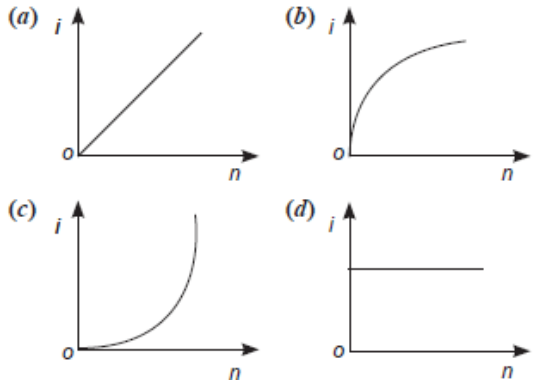
12 For a cell, the graph between the potential difference (V) across the terminals of the cell and the current (I) drawn from the cell is shown in the figure. 1



The e.m.f. and the internal resistance of the cell are
(a) 2V, 0.5 Ω (b) 2V, 0.4 Ω
(c) > 2V, 0.5 Ω (d) > 2V, 0.4 Ω

13 A Daniel cell is balanced on 125 cm length of a potentiometer wire. Now the cell is short-circuited by a resistance 2 ohm and the balance is obtained at 100 cm. The internal resistance of the Daniel cell is 1
(a) 0.5 ohm (b) 1.5 ohm
(c) 1.25 ohm (d) 4/5 ohm

14 A battery consists of a variable number ‘n’ of identical cells having internal resistances connected in series. The terminals of battery are short circuited and the current i is measured. Which of the graph below shows the relationship between i and n? 1



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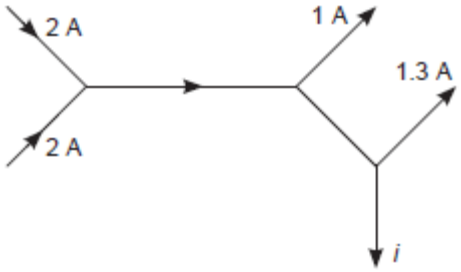


The figure below shows currents in a part of electric circuit. The current i is _____. 1

16 Kirchhoff's junction rule is a reflection of
(a) conservation of current density vector.
(b) conservation of potential.
(c) the fact that the momentum with which a charged particle approaches a junction is unchanged (as a vector) as the charged particle leaves the junction. 1
(d) the fact that there is no accumulation of charges at a junction.

17 Ohm's law is true.
(a) For metallic conductors at low temperature.
(b) For metallic conductors at high temperature. 1
(c) For electrolytes when current passes through them.
(d) For diode when current flows.

18 A cell of internal resistance 1.5 Ω and e.m.f. 1.5 volt balances on 500 cm length of a potentiometer wire. If a wire of 15 Ω is connected between the balance point and the cell, then the balance point will shift
(a) to zero (b) by 500 cm
(c) by 750 cm (d) no change 1

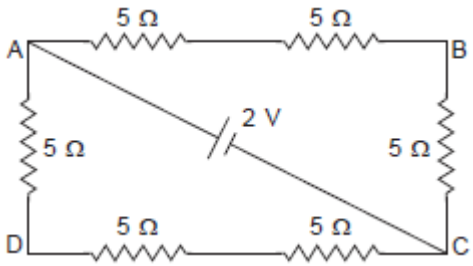
19 The terminal potential difference of a cell is greater than its e.m.f. when it is
(a) being discharged.
(b) in open circuit. 1
(c) being charged.
(d) being either charged or discharged.

20 If the length of potentiometer wire is increased, then the length of the previously obtained balance point will
(a) increase.
(b) decrease. 1
(c) remain unchanged.
(d) become two times.

21 Kirchhoff's first law, i.e. $\Sigma i = 0$ at a junction is based on the law of conservation of _____. 1

22 Kirchhoff 's second law is based on the law of conservation of _____. 1

23 The potential difference between points A and B of given figure is _____. 1



24 A cell of e.m.f. 1.5V having a finite internal resistance is connected to a load resistance of 2Ω. For maximum power transfer the internal resistance of the cell should be _____. 1

25 When the current i is flowing through a conductor, the drift velocity is v. If 2i current flows through the same metal but having the double area of cross-section, then the drift velocity will be _____. 1