69 * Wire ab carries an electric current of intensity 3 mA. The wire is connected in parallel to another wire of the same material and the same length but its diameter is three times as large as the first wire (ab), so the total current intensity which is required to be passed to keep the potential difference between the terminals of wire ab constant is ..... .

(a) 0.02 A (b) 0.1 A (c) 0.03 A (d) 0.5 A

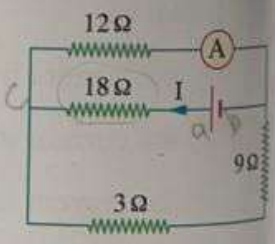
70 * Two wires A and B which have the same length are made of the same material, the cross-sectional area of wire A is double that of B. The two wires are connected together in parallel in an electric circuit and when the circuit is closed, the intensity of the passing current in the circuit becomes 3 A, so the current intensity through each of them; I_A and I_B, is ..... respectively.

(a) 2 A, 1 A (b) 2 A, 3 A (c) 3 A, 3 A (d) 2 A, 2 A

71 * An electric current of intensity 8 mA was passing through a thin metallic wire and when another wire of the same metal and the same length is connected in parallel with the first wire, the current has increases to 10 mA. To keep the potential difference across the wire unchanged, the ratio between the radii of the two wires $\left(\frac{r_1}{r_2}\right)$ must be ..... .

(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) $\frac{2}{1}$ (d) $\frac{5}{3}$

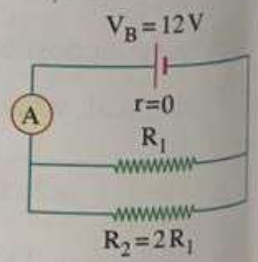
72 In the opposite electric circuit, the ammeter reading equals ..... .



(a) I (b) $\frac{I}{2}$

(c) $\frac{I}{3}$ (d) $\frac{I}{6}$

73 In the opposite figure, if the intensity of the passing electric current in resistor R_1 is 2 A, the equivalent resistance of the circuit is ..... .

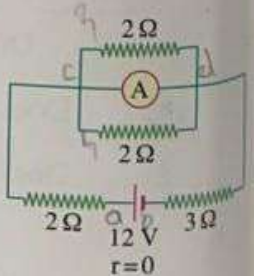


(a) 3 Ω (b) 4 Ω

(c) 6 Ω (d) 12 Ω

74 The reading of the ammeter in the opposite electric circuit is ..... .

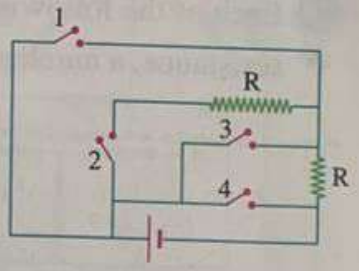
(Knowing that the resistance of the ammeter is negligible)



(a) 1 A (b) 1.2 A

(c) 2 A (d) 2.4 A

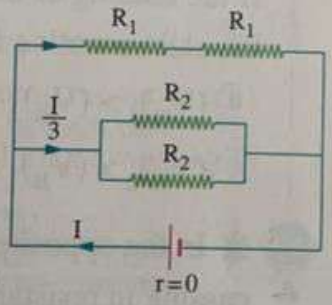
75 In the opposite electric circuit, the electric current through the battery becomes minimum value when closing switch ..... .



(a) 1 (b) 2

(c) 3 (d) 4

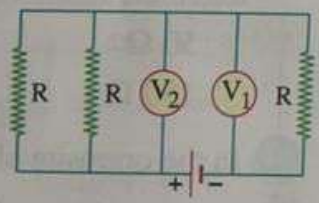
76 In the opposite electric circuit, the ratio between the values of the two resistors $(\frac{R_1}{R_2})$ equals ..... .



(a) $\frac{1}{2}$ (b) $\frac{1}{4}$

(c) $\frac{1}{8}$ (d) $\frac{1}{16}$

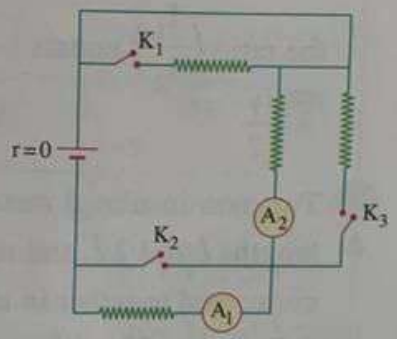
77 * From the opposite figure, the ratio between the voltmeter readings $(\frac{V_1}{V_2})$ equals ..... .



(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

(c) $\frac{2}{1}$ (d) $\frac{3}{1}$

78 In the opposite electric circuit, what happens to the readings of the two ammeters A_1 and A_2, respectively, when closing:



(i) switch K_1 only?

(a) Does not change, increases.

(b) Decreases, does not change.

(c) Does not change, does not change.

(d) Increases, decreases.

(ii) switch K_2 only?

(a) Increases, vanishes.

(b) Decreases, vanishes.

(c) Vanishes, decreases.

(d) Vanishes, increases.

(iii) switch K_3 only?

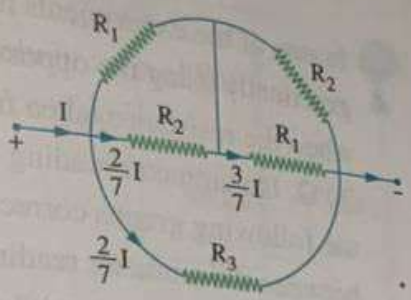
(a) Increases, decreases.

(b) Increases, does not change.

(c) Does not change, increases.

(d) Decreases, increases.

83 * Several electrical resistors are connected together where the electric currents that pass through them have intensities as shown in the opposite figure, so the correct order of resistors R_1, R_2, and R_3 concerning their values is .....

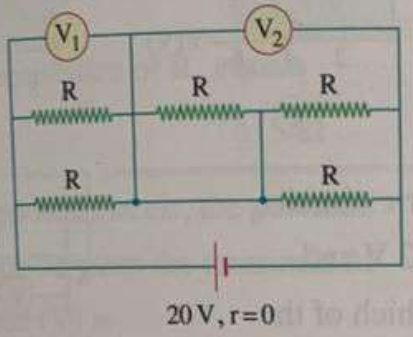


(a) $R_3 < R_2 < R_1$ (b) $R_1 < R_2 < R_3$

(c) $R_3 < R_2 = R_1$ (d) $R_2 = R_3 < R_1$

84 What are the readings of the two voltmeters V_1 and V_2 respectively in each of the following figures?

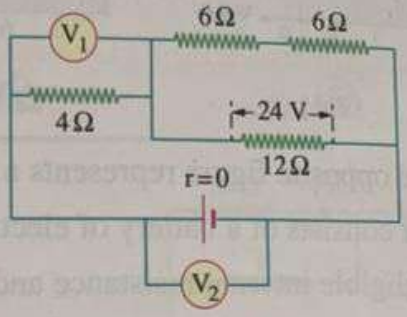
(i)



(a) 10 V, 10 V (b) 10 V, 20 V

(c) 20 V, 10 V (d) 20 V, 20 V

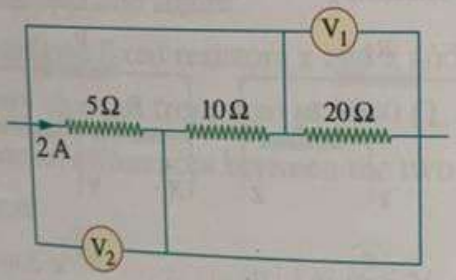
(ii)



(a) 16 V, 36 V (b) 16 V, 40 V

(c) 36 V, 36 V (d) 36 V, 40 V

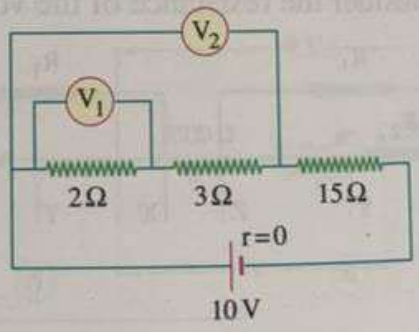
(iii)



(a) 10 V, 10 V (b) 10 V, 40 V

(c) 40 V, 10 V (d) 40 V, 40 V

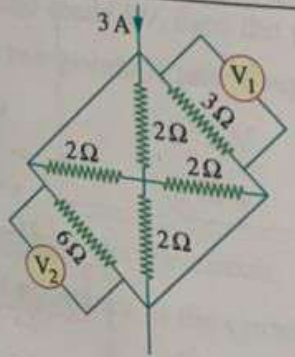
(iv)



(a) 1 V, 1.5 V (b) 1 V, 2.5 V

(c) 2 V, 1.5 V (d) 2 V, 2.5 V

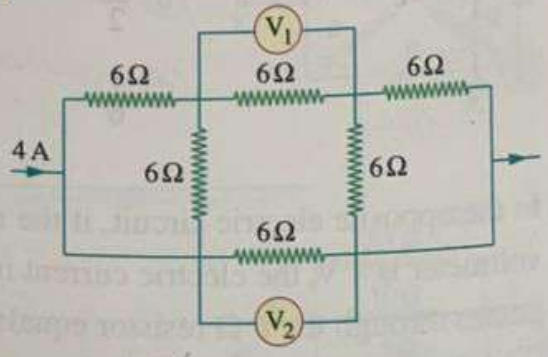
(v)



(a) 1.5 V, 3 V (b) 1.5 V, 1.5 V

(c) 3 V, 6 V (d) 3 V, 3 V

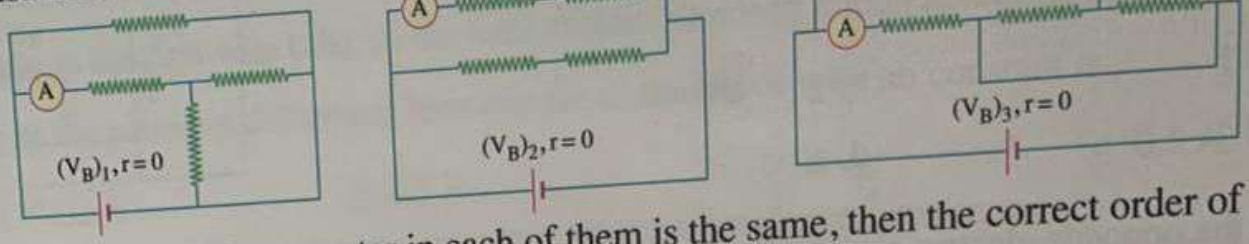
(vi)



(a) 12 V, 12 V (b) 4 V, 12 V

(c) 16 V, 16 V (d) 8 V, 16 V

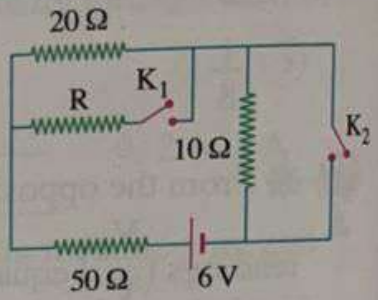
79 Each of the following electric circuits consists of a battery [illegible] resistance, a number of identical resistors, and an ammeter:



If the reading of the ammeter in each of them is the same, then the correct order of the electromotive forces of these batteries is .....

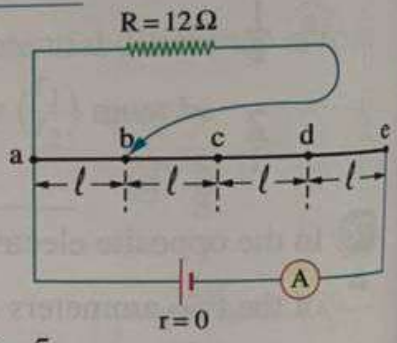
(a) $(V_B)_1 > (V_B)_2 > (V_B)_3$
(b) $(V_B)_3 > (V_B)_2 > (V_B)_1$
(c) $(V_B)_2 > (V_B)_1 > (V_B)_3$
(d) $(V_B)_2 > (V_B)_3 > (V_B)_1$

80 * In the opposite electric circuit, the intensity of current passing in resistance 20 Ω doesn't change in the case of closing switches K_1 and K_2 together or opening them together, so the resistance of R equals ..... .



(a) 50 Ω
(b) 100 Ω
(c) 150 Ω
(d) 200 Ω

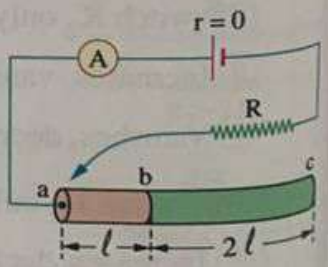
81 In the opposite electric circuit, a wire ae has a uniform cross-section and a resistance of 24 Ω. If the ammeter reading in this case equals I_1 and when the slider is moved from position b to position d, it becomes I_2, so the ratio $\left(\frac{I_1}{I_2}\right)$ equals ..... .



(a) $\frac{1}{2}$
(b) $\frac{2}{1}$
(c) $\frac{3}{5}$
(d) $\frac{5}{3}$

82 Two non-insulated metal conductors (ab) and (bc) of equal cross-sectional areas have lengths ℓ and 2ℓ, and resistivities ρ_e and $2\rho_e$ respectively. The two conductors are connected together in an electrical circuit as shown in the following figure, and the following table shows the change in the ammeter reading with the change in the slider position in the circuit,

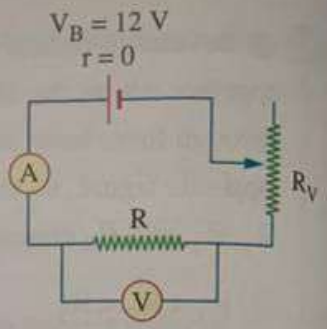
Slider position	Ammeter reading
a	I
b	$\frac{1}{2}$I
c	?

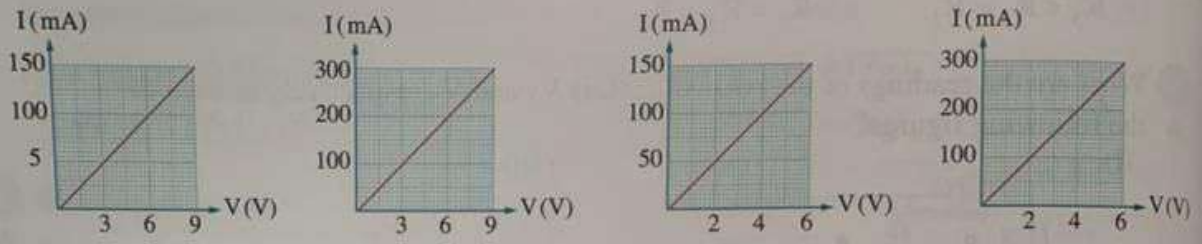


So, the ammeter reading when the slider becomes at position (c) will be ..... .

(a) $\frac{1}{3}$I
(b) $\frac{1}{4}$I
(c) $\frac{1}{6}$I
(d) $\frac{1}{8}$I

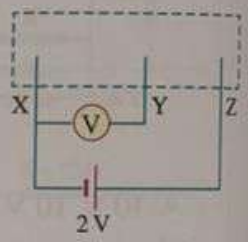
85 In one of the experiments to verify Ohm's law practically using the opposite electrical circuit, when the resistance taken from the rheostat was 20 Ω, the ammeter reading was 150 mA. Which of the following graphs correctly represents the relation between the ammeter reading (I) and the voltmeter reading (V) in this circuit?

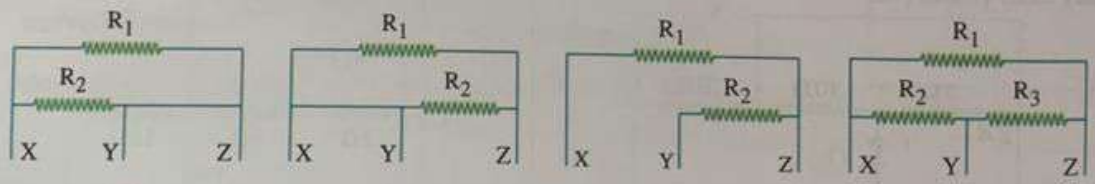




(a) (b) (c) (d)

86 The opposite figure represents a part of an electric circuit that consists of a battery of electromotive force 2 V and negligible internal resistance and a voltmeter, which of the following figures complete that circuit at points X, Y and Z in order for the voltmeter to read 1.5 V?
(Consider the resistance of the voltmeter to be infinite)



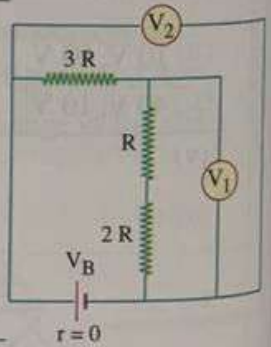


(a) (b) (c) (d)

87 In the opposite electric circuit, the ratio between the readings of $\left(\frac{V_1}{V_2}\right)$ is ..... .

(a) $\frac{1}{1}$ (b) $\frac{1}{2}$

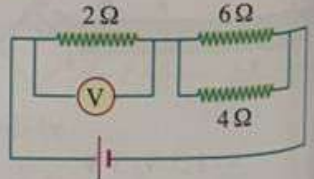
(c) $\frac{1}{3}$ (d) $\frac{1}{6}$



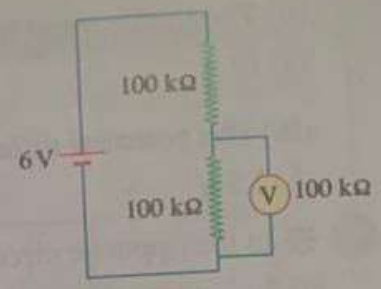
88 In the opposite electric circuit, if the reading of the voltmeter is 4 V, the electric current intensity that passes through the 6 Ω resistor equals ..... .

(a) 0.8 A (b) 1 A

(c) 1.2 A (d) 2 A

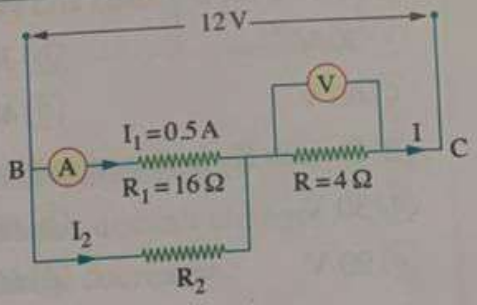


89 In the opposite figure, if the resistance of the voltmeter is 100 kΩ, how much does it read?



(a) 0 (b) 2 V
(c) 3 V (d) 4 V

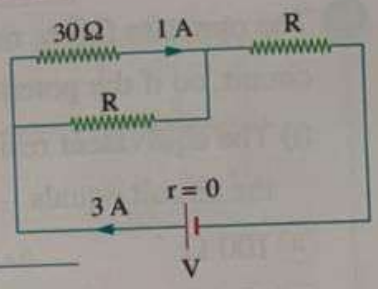
90 The opposite figure represents a part of an electric circuit, so:



(i) The voltmeter reading (V) equals ..... .
(a) 8 V (b) 4 V
(c) 2.5 V (d) 1.3 V

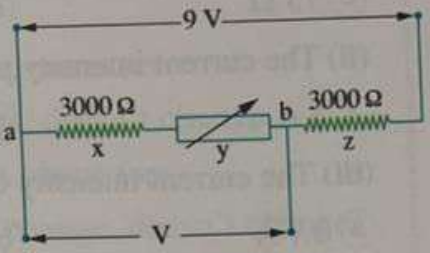
(ii) The resistance of R_2 equals ..... .
(a) 3 Ω (b) 5 Ω (c) 9 Ω (d) 16 Ω

91 In the opposite circuit, the potential difference between the terminals of the source (V) is ..... .



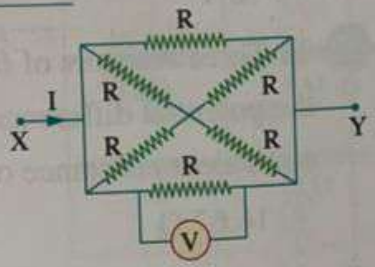
(a) 25 V (b) 50 V
(c) 75 V (d) 100 V

92 ✱ In the opposite figure:
There are two fixed resistors x and z and a variable resistor y changes from zero to 3000 Ω, so the range of potential differences between the two points a and b is from ..... .



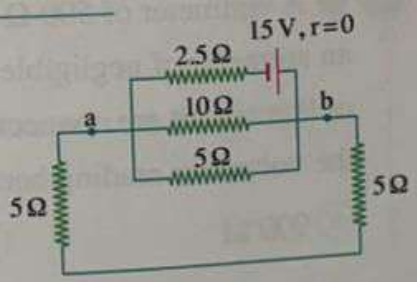
(a) 0 to 6 V (b) 3 V to 6 V
(c) 4.5 V to 6 V (d) 4.5 V to 9 V

93 The opposite figure represents a part of an electric circuit. If the voltmeter reads 1V, then the potential difference between the two points X and Y equals ..... .



(a) 1 V (b) 2 V
(c) 3 V (d) 4 V

94 ✱ In the opposite electric circuit:



(i) The total resistance in the circuit equals ..... .
(a) 3 Ω (b) 5 Ω
(c) 9 Ω (d) 11 Ω

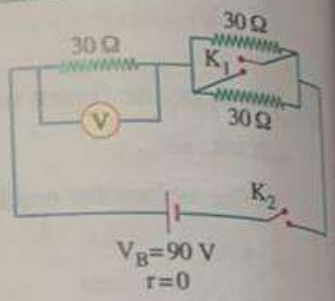
(ii) The total current intensity passing in the circuit equals ..... .

(a) 12 A (b) 5 A (c) 3 A (d) 2 A

(iii) The potential difference between the two points a and b equals ..... .

(a) 2.5 V (b) 5 V (c) 6 V (d) 7.5 V

95 ✱ In the opposite circuit, the reading of the voltmeter when:



(i) Switch K_2 is closed and switch K_1 is opened equals ..... .

(a) 20 V (b) 30 V (c) 60 V (d) 40 V

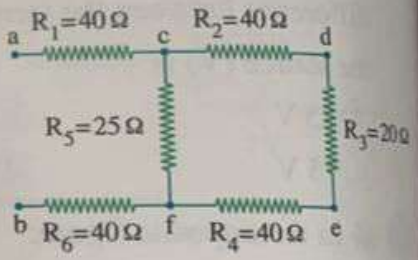
(ii) Switch K_2 is closed and switch K_1 is closed equals ..... .

(a) 30 V (b) 40 V (c) 90 V (d) 60 V

(iii) Switch K_2 is opened and switch K_1 is closed equals ..... .

(a) 0 (b) 20 V (c) 40 V (d) 60 V

96 The opposite figure represents a part of an electric circuit, so if the potential difference V_{ab} equals 200 V;



(i) The equivalent resistance of this part of the circuit equals ..... .

(a) 100 Ω (b) 80 Ω (c) 75 Ω (d) 54 Ω

(ii) The current intensity passing through resistance R_1 equals ..... .

(a) 5 A (b) 3.5 A (c) 2 A (d) 1.6 A

(iii) The current intensity through resistance R_5 equals ..... .

(a) 0.1 A (b) 0.4 A (c) 1.4 A (d) 1.6 A

(iv) The potential difference between the two points e and d equals ..... .

(a) 16 V (b) 12 V (c) 10 V (d) 8 V

97 ✱ Three resistors of 60 Ω, 40 Ω and 20 Ω are connected to an electric source where the potential difference across them are 30 V, 20 V and 50 V respectively, so the equivalent resistance of the circuit equals ..... .

(a) 16.67 Ω (b) 12.23 Ω (c) 10.53 Ω (d) 9.75 Ω

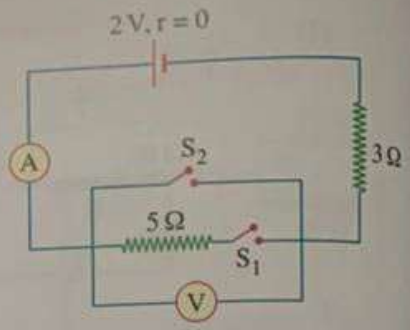
98 ✱ A voltmeter of 500 Ω resistance is connected in parallel to an unknown resistance, then an ammeter of negligible resistance is connected to them in series and when the terminals of this circuit are connected to an electric cell, the ammeter reading becomes 0.01 A and the voltmeter reading becomes 3 V, so the value of the unknown resistance is ..... .

(a) 900 Ω (b) 800 Ω (c) 750 Ω (d) 620 Ω

101 In the opposite circuit, the readings of the ammeter and the voltmeter at:

(i) Closing the two switches S_1 and S_2 together equals ..... .

	The ammeter reading	The voltmeter reading
(a)	0.67 A	0.2 V
(b)	0	0.3 V
(c)	0.67 A	0
(d)	0.5 A	0.3 V



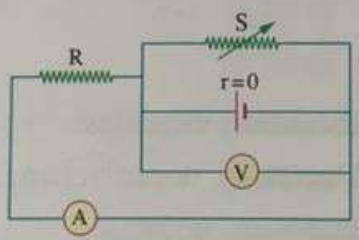
(ii) Closing switch S_1 and opening switch S_2 equals ..... .

	The ammeter reading	The voltmeter reading
(a)	3.2 A	1.2 V
(b)	0.25 A	1.25 V
(c)	1.25 A	3.2 V
(d)	0.25 A	2.05 V

---

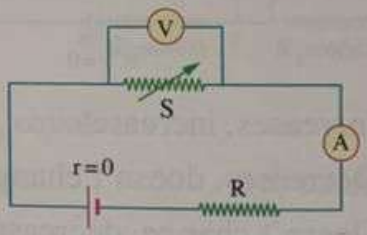
102 What happens to the readings of the ammeter and voltmeter, respectively, when increasing the value of variable resistance S in each of the following cases?

(i)



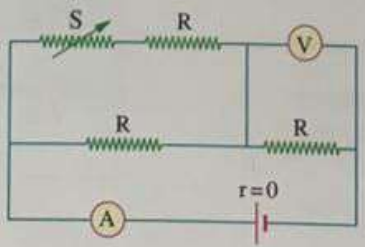
(a) Decreases, decreases.
(b) Decreases, doesn't change.
(c) Doesn't change, increases.
(d) Doesn't change, doesn't change.

(ii)



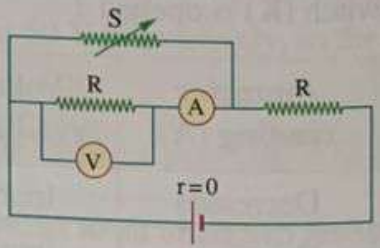
(a) Decreases, decreases.
(b) Decreases, increases.
(c) Increases, decreases.
(d) Increases, increases.

(iii)



(a) Decreases, decreases.
(b) Decreases, increases.
(c) Increases, decreases.
(d) Increases, increases.

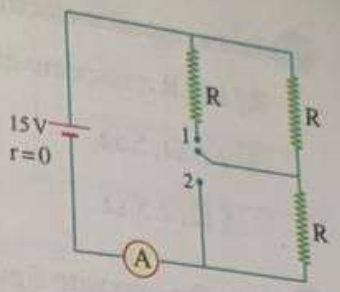
(iv)



(a) Decreases, decreases.
(b) Decreases, increases.
(c) Increases, decreases.
(d) Increases, increases.

103 In the opposite electric circuit:

(i) When closing the switch in direction (1), a current of intensity 2 A passes in the ammeter, thus the value of the resistance of R is ..... .



(a) 30 Ω (b) 5 Ω

(c) 7.5 Ω (d) 2.5 Ω

(ii) When closing the switch in direction (2), a current of intensity ..... passes in the ammeter.

(a) 1 A (b) 2 A (c) 3 A (d) 4 A

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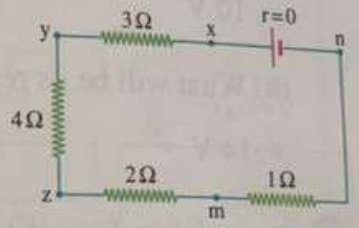
104 In the opposite electric circuit, what are the two points between which a free electron requires the greatest amount of work to be moved?



(a) x, y (b) y, z

(c) z, m (d) z, n

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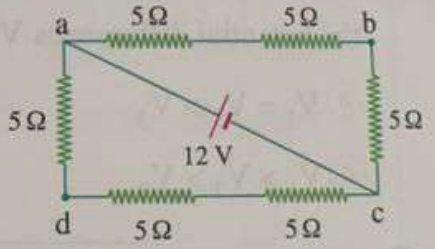
105 ✱ In the shown electric circuit, the potential difference between the two points b and d equals ..... .



(a) 2 V (b) 4 V

(c) 6 V (d) 8 V

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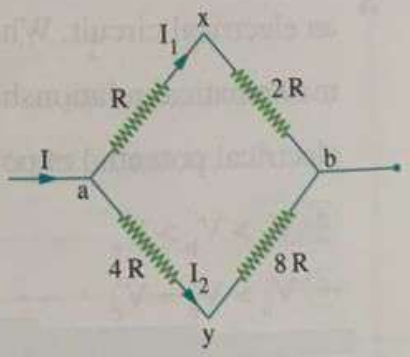
106 ✱ In the opposite figure:

The potential difference between x and y equals ..... .



(a) 0

(b) 3 IR

(c) 6 IR

(d) IR

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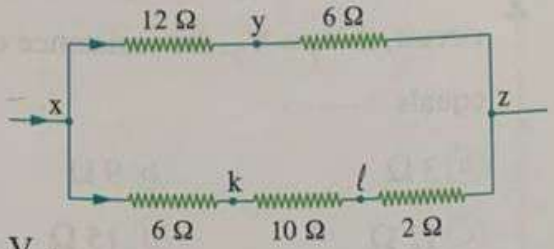
107 The opposite figure represents a part of an electric circuit, which of the following is correct regarding the ratio of the potential differences between the shown points?

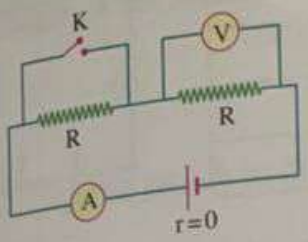


(a) $V_{k\ell} > V_{xy}$ (b) $V_{yz} > V_{xk}$

(c) $V_{xy} = V_{kz}$ (d) $V_{xz} = 2\,V_{\ell z}$

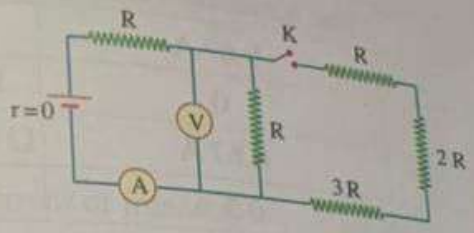
99 What happens to the readings of the ammeter and voltmeter, respectively, when the switch K is closed in each of the following cases?

(i)



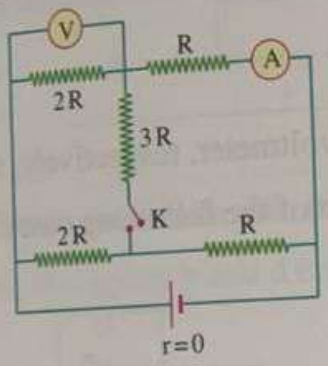
(a) Increases, increases.
(b) Decreases, decreases.
(c) Decreases, increases.
(d) Increases, decreases.

(ii)



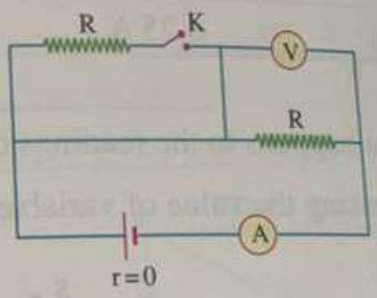
(a) Increases, increases.
(b) Decreases, doesn't change.
(c) Increases, decreases.
(d) Doesn't change, doesn't change.

(iii)



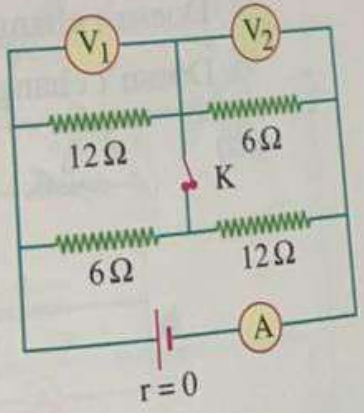
(a) Increases, increases.
(b) Decreases, doesn't change.
(c) Doesn't change, decreases.
(d) Doesn't change, doesn't change.

(iv)



(a) Increases, increases.
(b) Decreases, doesn't change.
(c) Increases, decreases.
(d) Doesn't change, doesn't change.

100 In the opposite electrical circuit, what happens to the reading of each of the ammeter (A) and the voltmeters (V_1) and (V_2) when the switch (K) is opened ?



	Ammeter reading (A)	Voltmeter reading (V_1)	Voltmeter reading (V_2)
(a)	Decreases	Increases	Increases
(b)	Decreases	Increases	Decreases
(c)	Increases	Increases	Increases
(d)	Increases	Decreases	Decreases