PHYSICS

BOOKS - CENGAGE PHYSICS (ENGLISH)

ELECTRIC CURRENT & CIRCUITS

Restivity And Drift Velocity

1. Is the motion of a charge across junction momentum conserving ? Why or why not ?

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2. The relaxation time τ is nearly independent of applied electric field E whereas it changes significiantly with temperature T. First fact is (in part) responsible for Ohm's law whereas the second fact leads to variation of p with temperature. Elaborate why ?

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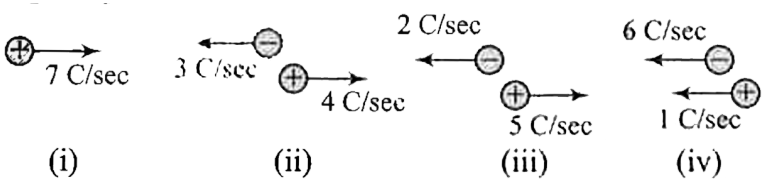
3. Following figures show four situations in which positive and negative charges move horizontaly through a region and give the rate at which each charge moves. Rank the situations according to the effective current through the region greatest first.



A. i=ii=iii=iv

B. igtiigtiiigtiv

C. i=ii==iiigtiv

D.

Answer: C

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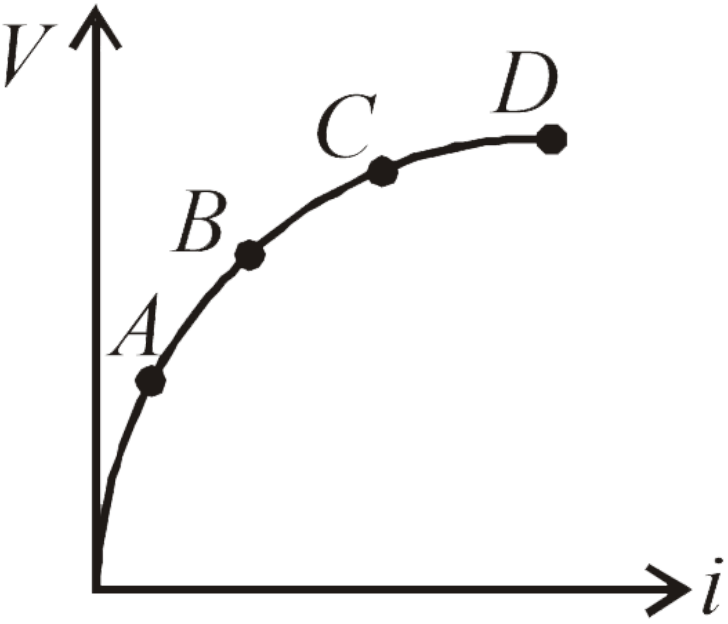
4. Variation of current passing through a conductor as the voltage applied across its ends is varied as shown in the adjoining diagram. If the resistance (R) is determined at

the points A, B, C and D, we will find that



A. $R_C = R_D$

B. $R_B > R_A$

C. $R_C > R_B$

D. None of these

Answer: D

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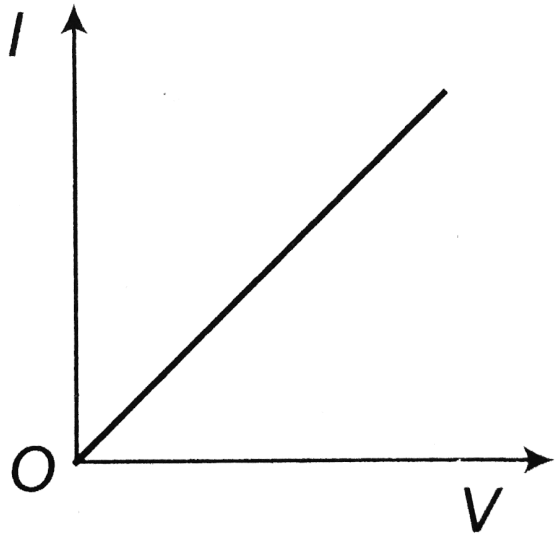
5. $I - V$ characterstic of a copper wire of length L and area fo cross-section A is shown

in Fig. The slope of the curve becomes



A. More if the experiment is performed at higher temperature

B. More if a wire of steel of the same direction is used

C. more if the length of the wire is increased

D. Less if the length of the wire is increased

Answer: D

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6. The resistance R of a conductor varies with temperature t as shown in the figure. If the variation is represented by

$R_t = R_0\left[1 + \alpha t + \beta t^2\right]$, then

A. α and β are both negative

B. α and β are positive

C. α is positive and β is negative

D. α is negative and β is positive

Answer: B

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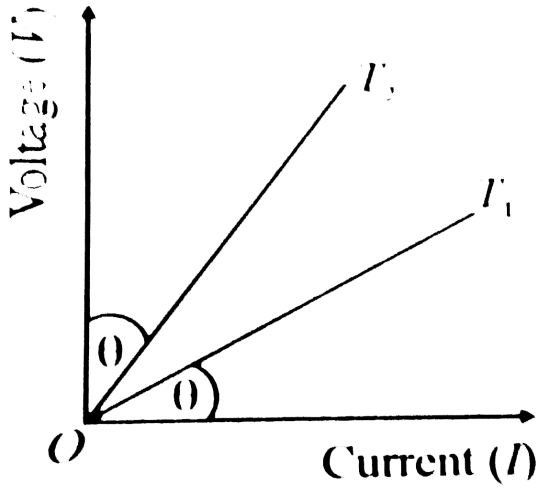
7. The V-I graph for a conductor at temperature T_1 and T_2 are as shown in the figure. The term $(T_2 - T_1)$ is proportional to



A. $\cos 2\theta$

B. $\sin \theta$

C. $\cot 2\theta$

D. $\tan \theta$

Answer: C

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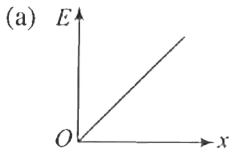
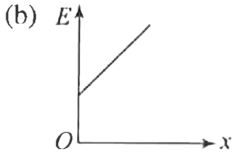
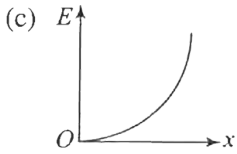
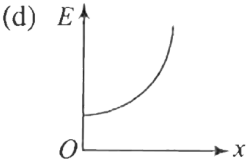
8. A cylindrical conductor has uniform cross-section. Resistivity of its material increase linearly from left end to right end. If a

constant current is flowing through it and at a section distance x from left end, magnitude of electric field intensity is E , which of the following graphs is correct

A. 

B. 

C. 

D. 

Answer: B

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9. Dimensions of a block are $1cm \times 1cm \times 100cm$. If specific resistance of its material is $3 \times 10^{-7} ohm - m$, then the resistance between the opposite rectangular facesis

A. $3 \times 10^{-9}\Omega$

B. $3 \times 10^{-7}\Omega$

C. $3 \times 10^{-5}\Omega$

D. $3 \times 10^{-3}\Omega$

Answer: B

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10. Dimensions of a block are $1cm \times 1cm \times 100cm$. If specific resistance of its material is $3 \times 10^{-7} ohm - m$, then the resistance between the opposite square faces is

A. $3 \times 10^{-9}\Omega$

B. $3 \times 10^{-7}\Omega$

C. $3 \times 10^{-5}\Omega$

D. $3 \times 10^{-3}\Omega$

Answer: D

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11. A Steady current flows in a metalic conductor of non uniform cross section. The

quantity/quantities which remain constant along the length of the conductor is/are

A. Current, electric field and drift speed

B. Drift speed only

C. Current and drift speed

D. Current only

Answer: D

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12. A current I is passing through a wire having two sections P and O of uniform diameters d and $d/2$ respectively. If the mean drift velocity of electrons in section P and Q is denoted by v_P and v_Q respectively, then

A. $v_P = v_Q$

B. $v_P = \frac{1}{2} v_Q$

C. $v_p = \left(\frac{1}{4}\right) v_Q$

D. $v_P = 2v_Q$

Answer: C

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13. The resistance of a wire is 10Ω. Its length is increased by 10% by stretching. The new resistance will now be

A. 0.1

B. 0.25

C. 0.21

D. 0.09

Answer: C

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14. Which of the following characteristics of electrons determines the current in a conductor?

A. Drift velocity alone

B. Thermal velocity alone

C. Both drift velocty and thermal velocity

D. Neither drift nor thermal velocity

Answer: A

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15. Temperature dependence of resistivity $\rho(T)$ of semiconductors, insulators and metals is significantly based on the following factors.

A. number of charge carriers can change with temperature T

B. time interval between two successive collisions can depend on T

C. length of material can be a function of T

D. mass of carriers is a function of T

Answer: A::B

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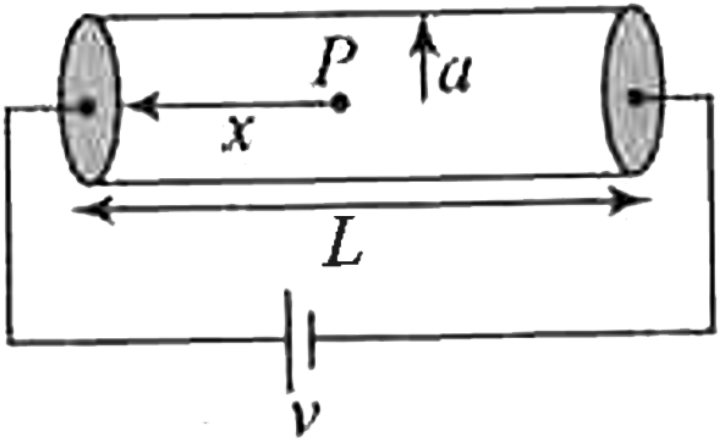
16. A cylindrical solid of length L and radius a is connected across a source of emf V and negligible internal resistance shown in figure. The resistivity of the rod at point P at a distance x from left end is given by $\rho = bx$

(where b is a positive constant). Find the electric field at point P.



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17. A comon flashlight bulb is rated 0.30A and 2.7V (the values of the current and voltage under operating conditions.) If the resistance

of the tungsten bulb filament at room temperature $20^{\circ}C$ is 1.0Ω and its temperature coefficient of resistivity is $4.0 \times 10^{-3}C^{-1}$, then find the temperature in centigrade of the filament when the bulb is on. (Consider the variationi of resistance to be linear with temperature.)

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18. Two wires of resistance R_1 and R_2 have temperature coefficient of resistance α_1 and

α_2 respectively. These are joined in series. The effective temperature coefficient of resistance is

A. (alpha_(1) + alpha_(2))/2`

B. $\left(\sqrt{\alpha_1 \alpha_2}\right)$

C. $\frac{\alpha_1 R_1 + \alpha_2 R_2}{R_1 + R_2}$

D. $\left(\frac{\sqrt{R_1 R_2 \alpha_1 \alpha_2}}{\sqrt{R_1^2 + R_2^2}}\right.$

Answer: C

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19. Two resistance R_1 and R_2 are made of different material. The temperature coefficient of the material of R_1 is α and of the material of R_2 is $-\beta$. Then resistance of the series combination of R_1 and R_2 will not change with temperature, if R_1 / R_2 will not change with temperature if R_1 / R_2 equals

A. $\frac{\alpha}{\beta}$

B. $\frac{\alpha + \beta}{\alpha - \beta}$

C. $\frac{\alpha^2 + \beta^2}{\alpha\beta}$

D. $\frac{\beta}{\alpha}$

Answer: D

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20. An ionization chamber with parallel conducting plates as anode and cathode has 5×10^7 electrons and the same number of singly-charged positive ions per cm^3. The electrons are moving at $0.4m/s$. The current density from anode to cathodes $4\mu A/m^2$. The

velocity of positive ions moving towards cathode is

A. $0.4m/s$

B. $16m/s$

C. Zero

D. $0.1m/s$

Answer: D

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21. The current in conductor varies with time t as $I = 2t + 3t^2$ where I is in ampere and t in seconds. Electric charge flowing through a section of the conductor during $t = 2\,\text{sec}$ to $t = 3\,\text{sec}$ is

A. 10C

B. 24C

C. 33C

D. 44C

Answer: B

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22. The resistance of a wire of iron is $10ohm$ and temperature coefficient of resistivity is $5 \times 10^{-3}/.^{\circ} C$, At $20^{\circ}C$ it carries $30mA$ of current. Keeping constant potential difference between its ends. The temperature of the wire is raised to $120^{\circ}C$. The current in mA that flows in the wire now is.

A. 20

B. 15

C. 10

D. 40

Answer: A

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23. Length of a hollow tube is $5m$, its outer diameter is $10cm$ and thickness of its wall is 5 mm. If resistivity of the material of the tube is $1.7 \times 10^{-8}\Omega \times m$ then resistance of tube will be

A. $5.6 \times 10^{-5}\Omega$

B. $2 \times 10^{-5}\omega$

C. $4 \times 10^{-5}\Omega$

D. None of these

Answer: A

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24. In order to increase the resistance of a given wire of uniform cross section to four times its value, a fraction of its length is

stretched uniformly till the full length of the wire becoes $\frac{3}{2}$ times the original length. What is the value of this fraction?

A. $\frac{1}{8}$

B. 1/6`

C. $\frac{1}{10}$

D. $\frac{1}{4}$

Answer: A

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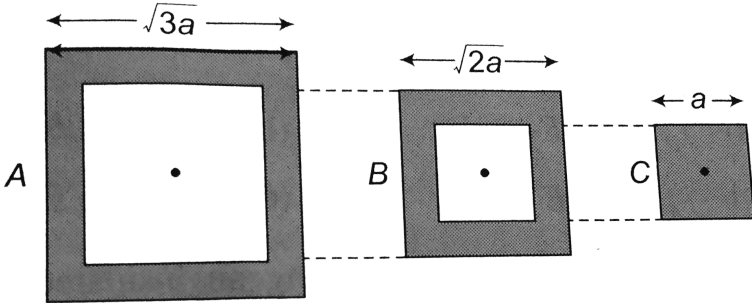
25. Following figure shows cross-section through three long conductors of the same length and material, with square cross-section of edge lengths as shown. Conductor B will snugly within conductor B. Relationship between their end to end resistance is



A. $R_A = R_B = R_C$

B. $R_A > R_B > R_C$

C. $R_A < R_B < R$

D. Information is not sufficient.

Answer: A

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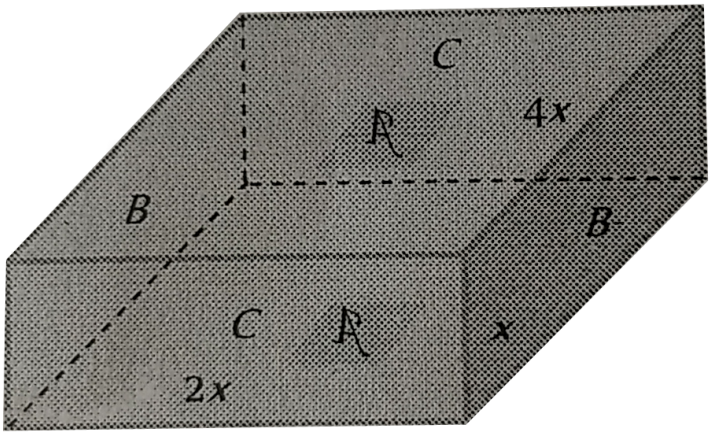
26. In figure shows a rectangular block with dimensions x , 2 x and 4 x . Electrical contacts can be made to the block between opposite pairs of faces (for example, between the faces labelled A - A , B - B and C - C). Between which

two faces would the maximum electrical resistance be obtained (A - A : Top and bottom faces, B - B : Left and right faces, C - C : Front and rear faces)



A. A-A

B. B-B

C. C-C

D. Same for all three pairs

Answer: C

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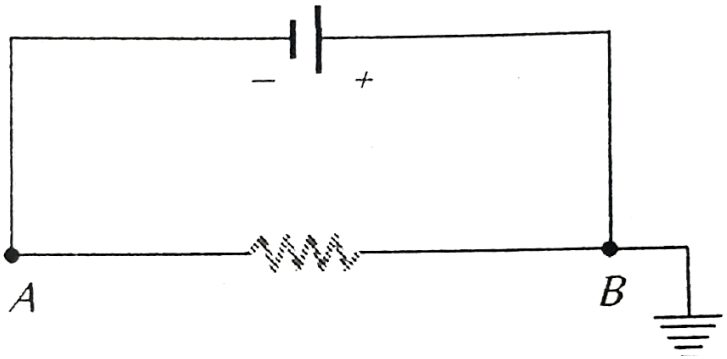
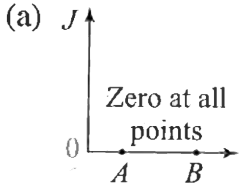
27. A battery is connected to a uniform resistance wire AB and B is earthed. Which one of the graphs below shows how the current

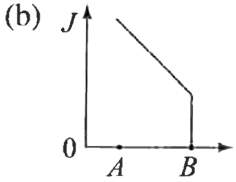
density J varies along AB



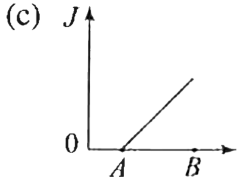
A.

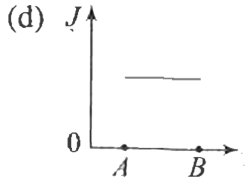


B.



C.



D. 

Answer: D

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28. Two wires each of radius of cross section r but of different materials are connected together end to end (in series). If the densities of charge carries in the two wires are in the

ratio $1:4$, the drift velocity of electrons in the two wires will be in the ratio:

A. $1:2$

B. $2:1$

C. $4:1$

D. $1:4$

Answer: C

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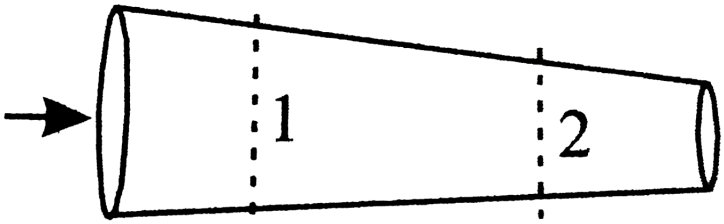
29. Consider a conductor of variable cross section in which current is flowing from cross section 1 to 2. Then



A. current density at A = current density at B

B. current density at A gt current density at B

C. current density at A gt current density at B

D. none of the above

Answer: B

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30. A 150 m long metal wire connects points A and B. The electric potential at point B is 50V less than that at point A. If the conductivity of

the metal is $60 \times 10^6 mho/m$ then magnitude of the current density in the wire is equal to:

A. $11 \times 10^{-4} A/m^2$

B. $5.5 \times 10^{-3} A/m^2$

C. $4 \times 10^7 A/m^2$

D. $20 \times 10^6 A/m^2$

Answer: D

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Combination Of Resistance 1

1. First a set of n equal resistors of R each are connected in series to a battery of emf E and internal resistance R, A current I is observed to flow. Then, the n resistors are connected I parallel to the same battery.

It is observed that the current is increased 10 times. what is 'n'?

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2. Suppose there is a circuit consisting of only resistances and batteries suppose one is to double (or increase it to n-times) all voltages and all resistances. Show that current s are unaltered.

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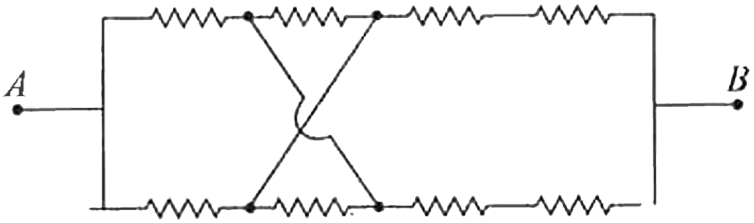
3. Find the equivalent resistance between terminals A and B. Each resistor is of

resistance R.



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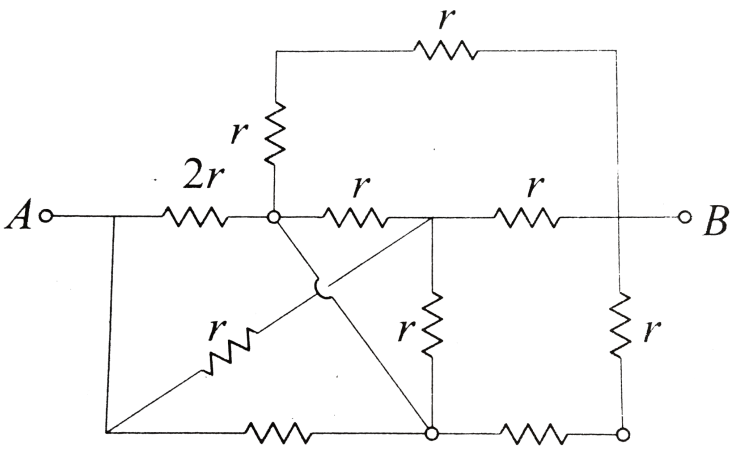
4. The equivalent resistance between A and B in the arrangement of resistance as shown is



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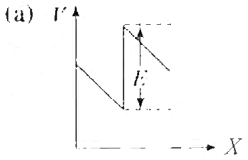
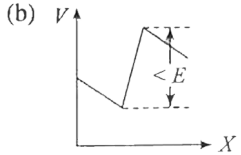
5. The two ends of a uniform conductor are joined to a cell of e.m.f. E and some internal resistance. Starting from the midpoint P of the conductor, we move in the direction of current and return to P. The potential V at

every point on the path is plotted against the distance covered (x). which of the following graphs best represent the resulting curve ?

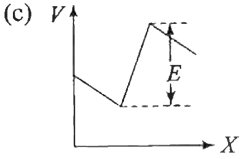
A.



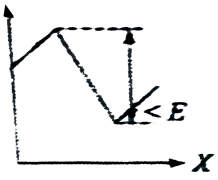
B.



C.



D.



Answer: B

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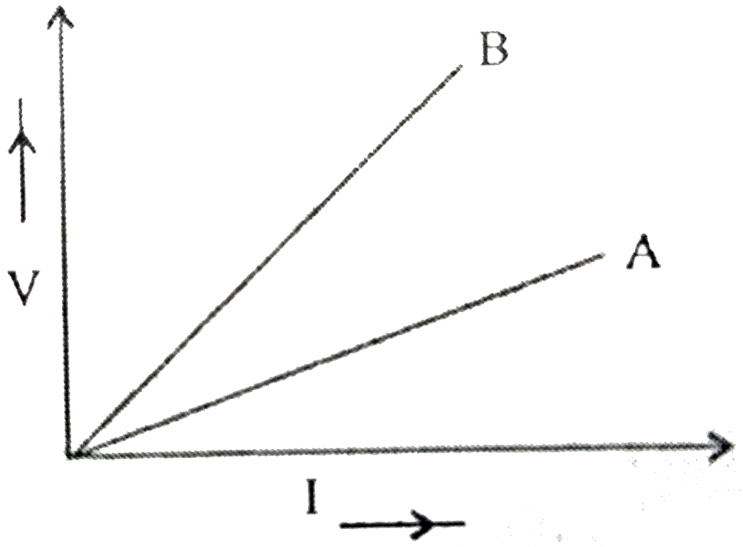
6. V-I graph for parallel and series combination of two metallic resistors are shown in adjoining figure. Which graph represents

parallel combination ?



A. A

B. B

C. A and B both

D. Neither A nor B

Answer: A

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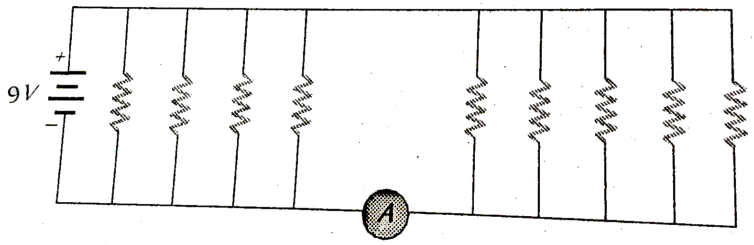
7. If each resistance in the figure is of 9Ω then reading of ammeter is



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8. Two resistors of resistance R_1 and R_2 having $R_1 > R_2$ are connected in parallel. For equivalent resistance R, the correct statement is

A. $R > R_1 > R_2$

B. $R_1 < R < R_2$

C. $R_2 < R < (R_1 + R_2)$

D. $R < R_1$

Answer: D

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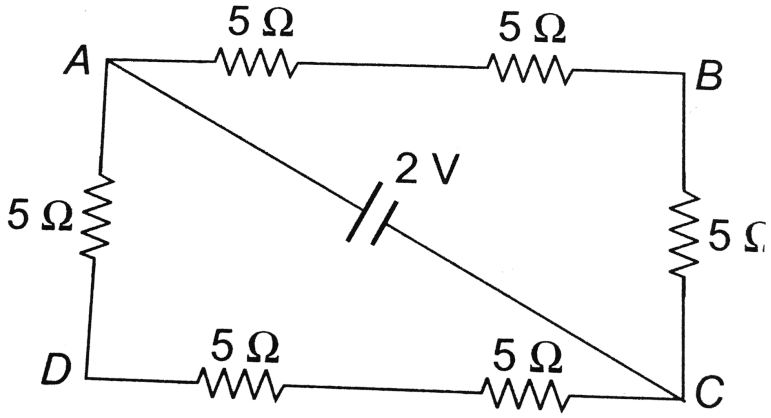
9. The potential difference between points A and B adjoining figure is



A. 2/3V

B. 8/9V

C. 4/3V

D. 2V

Answer: C

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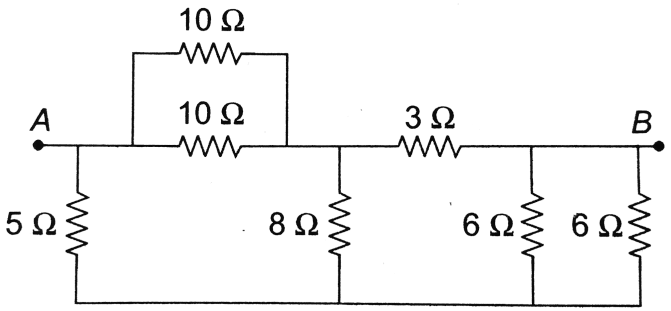
10. Seven resistance are connected as shown in the firgure. The equivalent resistance between A and B is approximately



A. 3Ω

B. 4Ω

C. 4.5Ω

D. 5Ω

Answer: A

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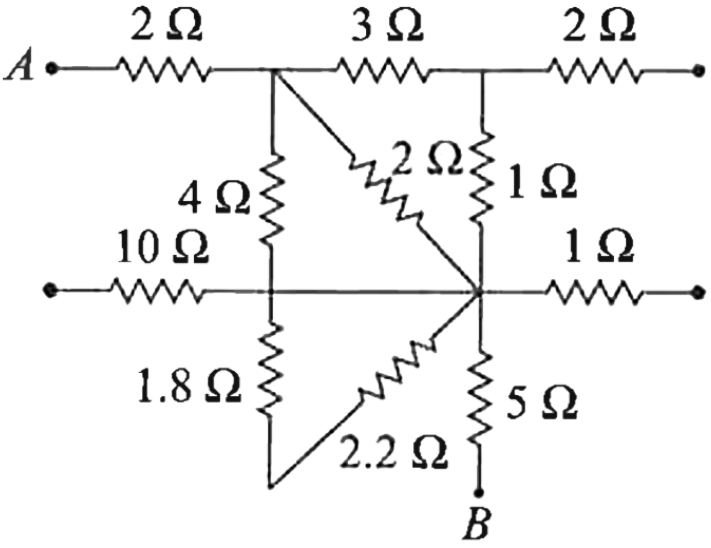
11. What is the equivalent resistance between the points A and B of the network?



A. $\frac{57}{7}\Omega$

B. 8Ω

C. 6Ω

D. $\frac{57}{3}\Omega$

Answer: B

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12. A uniform wire of resistance 9Ω is cut into 3 equal parts. They are connected in form of equilateral triangle ABC. A cell of e.m.f. $2V$ and negligible internal resistance is connected across B and C. Potential difference across AB is

A. 1V

B. 2V

C. 3V

D. 0.5V

Answer: A

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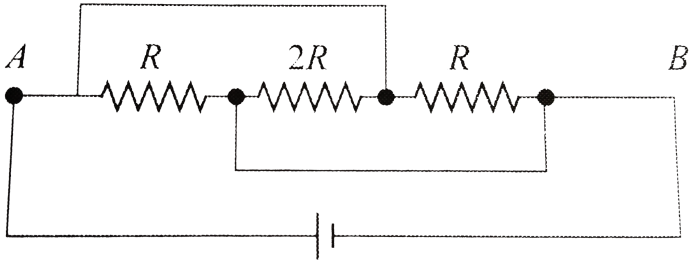
13. In fig. the current flowing through 2R is



A. from left to right

B. from right to left

C. no current

D. none of these

Answer: B

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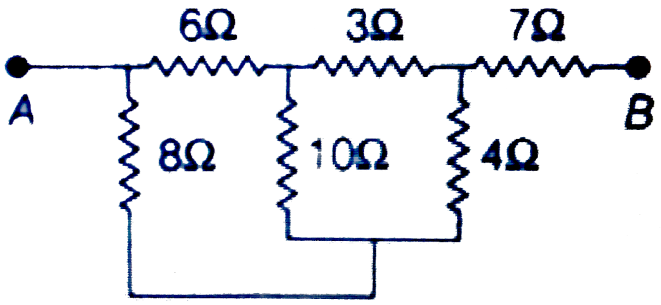
14. The equivalent resistance between the points A and B is



A. $\frac{36}{7}\Omega$

B. 10Ω

C. $\frac{85}{7}\Omega$

D. none of these

Answer: C

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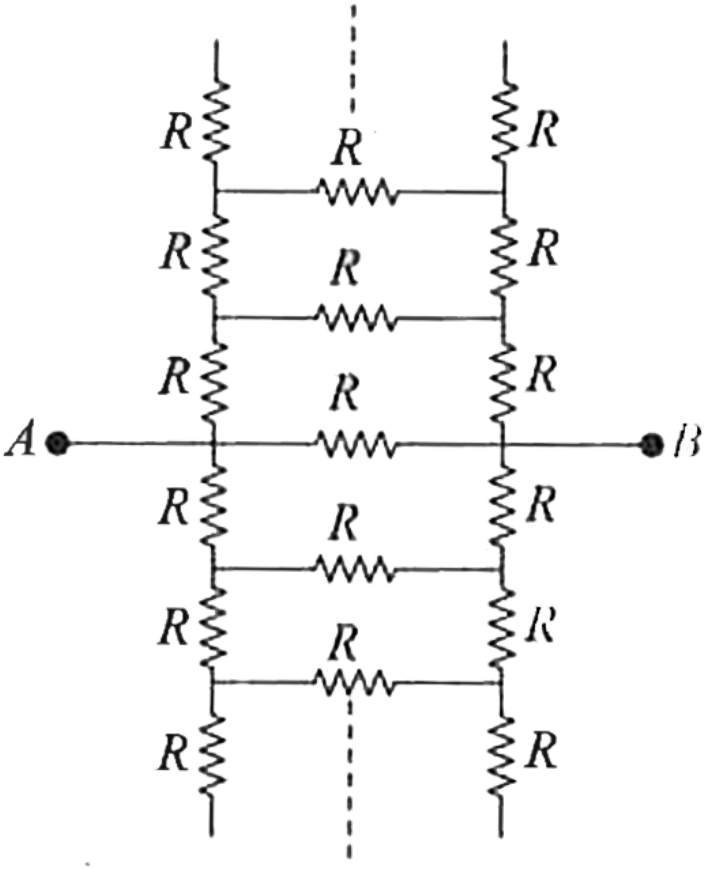
Combination Of Resistance 2

1. If each resistance $R = 100\sqrt{3}\Omega$, then find the equivalent resistance (in ohm) between A and B.



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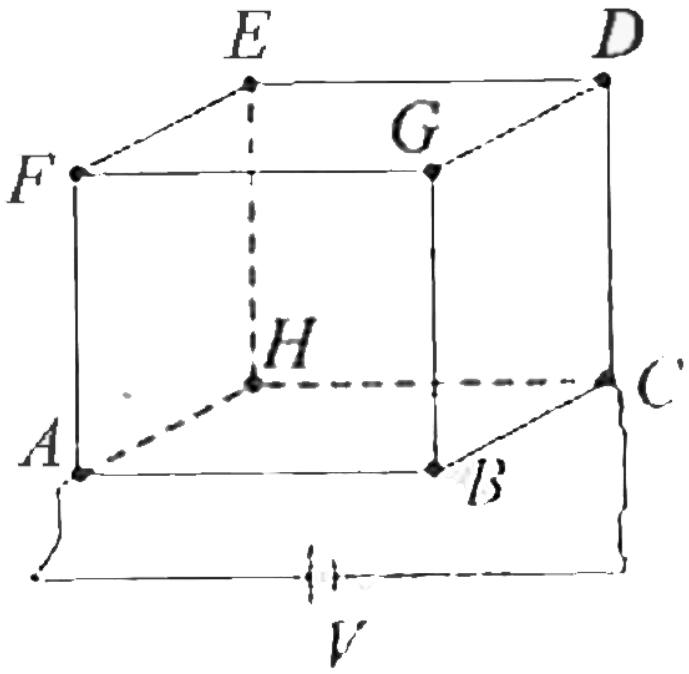
2. In the figure shown eight resistors eachof resistance 'R' are connected to form two squares ABCH and DEFG. Four resistors each of resistors '2R' are connected in the vertical lines AF, BG, CD and EH. 'A' and 'C' are connected to a battery of interal resistance 'R'

and emf V. Find out the current in 'AB' and 'ED'.



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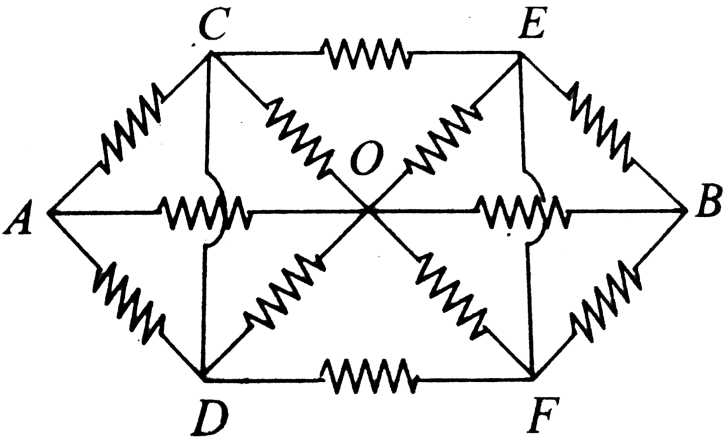
3. Find the equivalent resistance between A and B. Each resistor has same resistance R.



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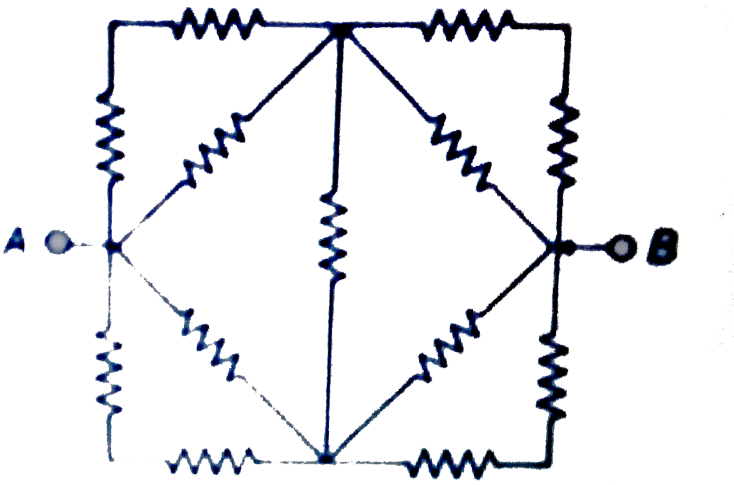
4. Thirteen resistors each of resistance R connected in the circuit as shown in figure.

Resistance between A and B is



A. $2R\Omega$

B. $4\frac{R}{3}\Omega$

C. $2\frac{R}{3}\Omega$

D. $R\omega$

Answer: C

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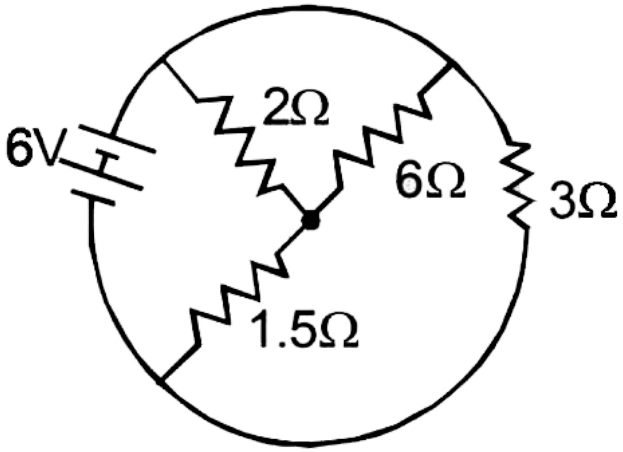
5. The total current supplied to the circuit by the battery is



A. 1A

B. 2A

C. 4A

D. 6A

Answer: C

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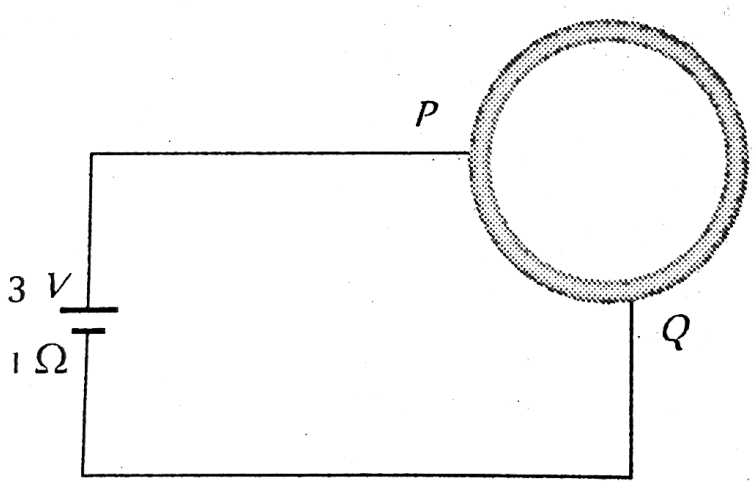
6. A wire of resistance 10Ω is bent to form a circle. P and Q are points on the circumference of the circle dividing it into a quadrant and are connected to a Battery of 3 V and internal resistance 1Ω as shown in the figure. The

currents in the two parts of the circle are



A. $\frac{6}{23}A$ and $\frac{18}{23}A$

B. $\frac{5}{26}A$ and $\frac{15}{26}A$

C. $\frac{4}{25}A$ and $\frac{12}{25}A$

D. $\frac{3}{25}A$ and $\frac{9}{25}A$

Answer: A

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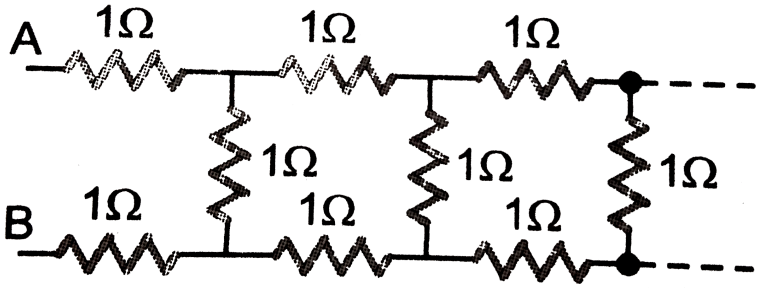
7. The resistance between the terminal point A and B of the given infinitely long circuit will be



A. $\left(\sqrt{3}-1\right)$

B. $\left(1-\sqrt{3}\right.$

C. $\left(1+\sqrt{3}\right.$

D. $\left(2+\sqrt{3}\right.$

Answer: C

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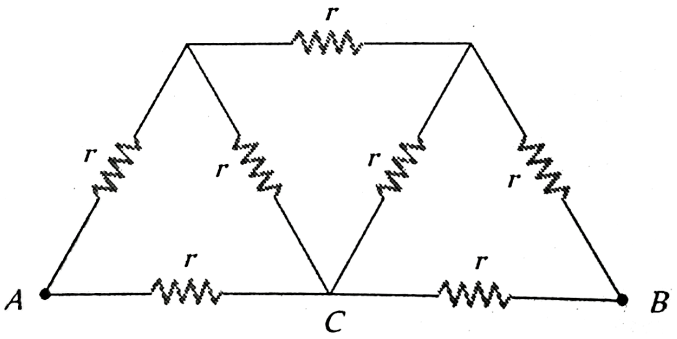
8. In the circuit shown, the value of each resistance is r , then equivalent resistance of circuit between points A and B will be



A. 14/11 r

B. 7/5 r

C. 8/7 r

D. 14/13 r

Answer: D

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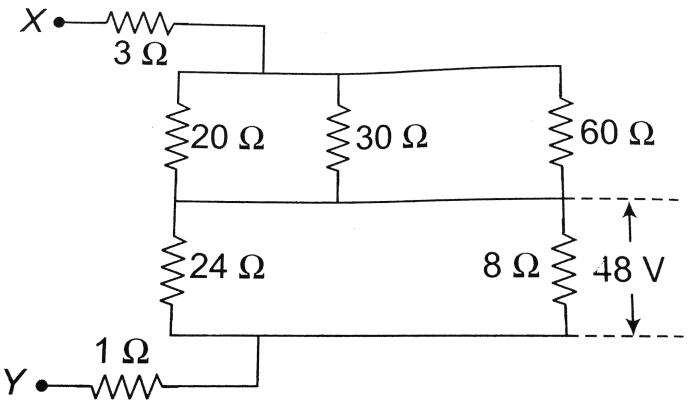
9. The potential difference across 8 ohm resistance is 48 volt as shownin the figure. The value of potential difference across X and Y

point will be



A. 160 volt

B. 128 volt

C. 80volt

D. 62volt

Answer: A

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10. The resistance of the series combination of two resistances is S. When they are joined in parallel the total resistance is P. If S= nP then the minimum possible value of n is

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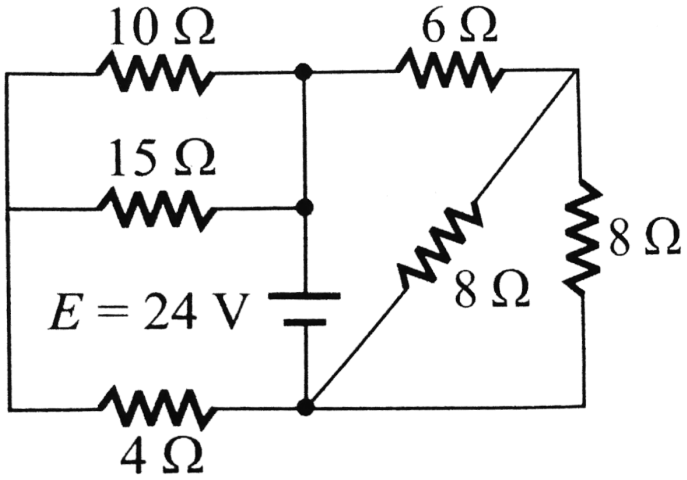
11. The equivalent resistance across the terminals of source of e.m.f. $24V$ for the circuit

shown in the figure is



A. 15Ω

B. 10Ω

C. 5Ω

D. 4Ω

Answer: C

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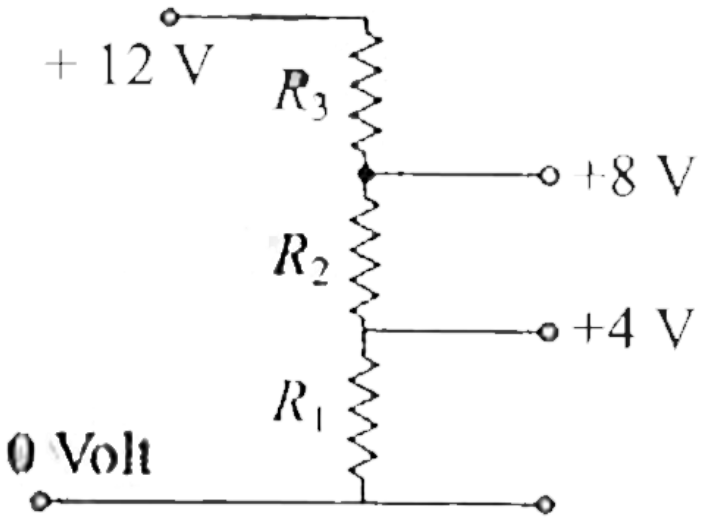
12. A potential divider is used to give outpurs of 4V and 8V from a 12V source. Which combination of resistance, (R_1, R_2, R_3 gives the correct voltages? (R_(1) : R_(2) : R_(3)`



A. $2:1:2$

B. $1:1:1$

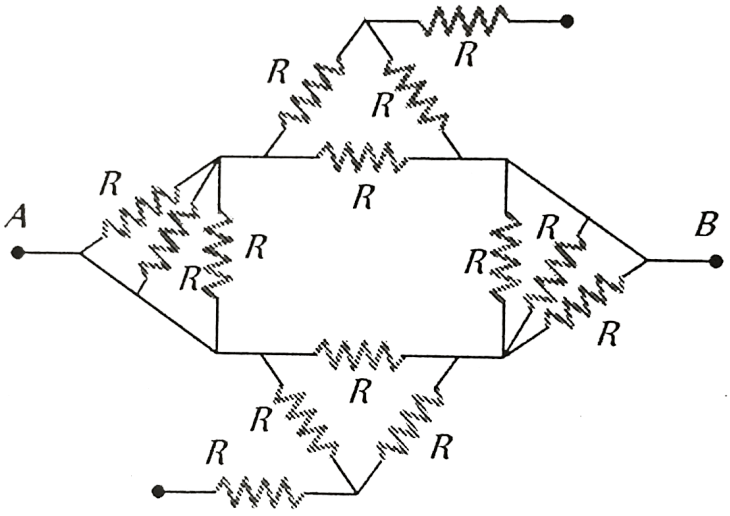
C. $2:2:1$

D. $1:1:2$

Answer: B

 Watch Video Solution

13. Find equivalent resistance between A and B



A. R

B. $\frac{3R}{4}$

C. $\frac{R}{2}$

D. 2R

Answer: C

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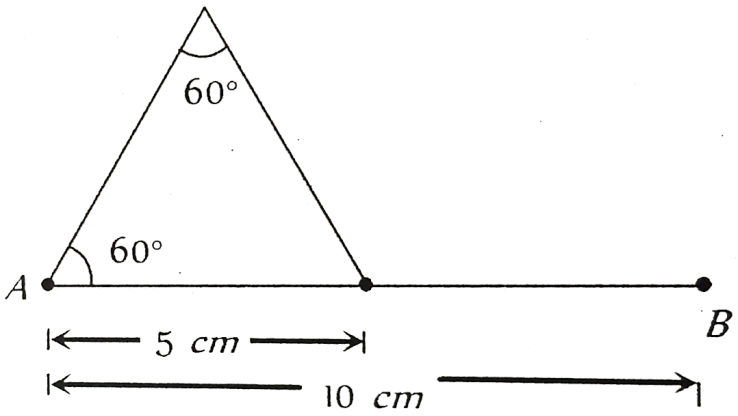
14. A wire has resistance of 24Ω is bent in the following shape. The effective resistance between A and B is



A. 24Ω

B. 10Ω

C. $\frac{16}{3}\Omega$

D. None of these

Answer: B

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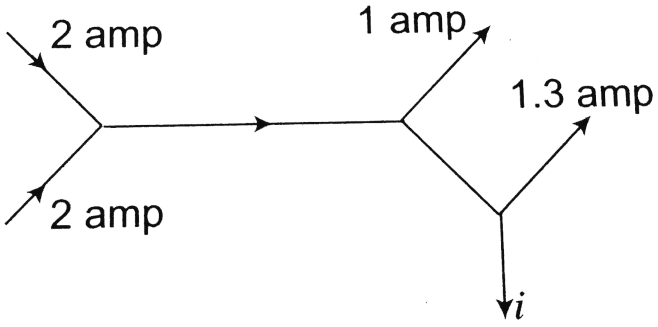
Kirchhoff S Law And Grouping Cells

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



A. 1.7amp

B. 3.7amp

C. 1.3amp

D. 1amp

Answer: A

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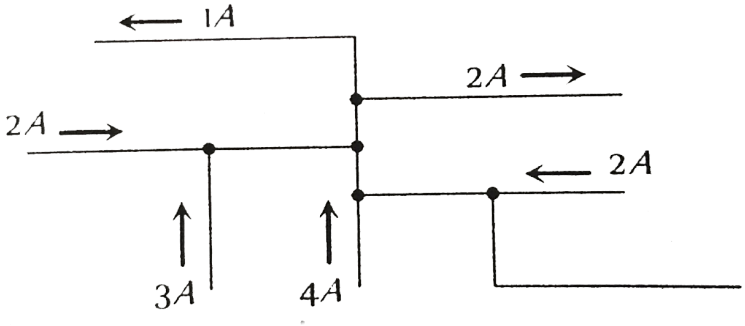
2. The figure here shows a portion of a circuit. What are the magnitude and direction of the current i in the lower right-hand wire



A. 7A

B. 8A

C. 6A

D. 2A

Answer: B

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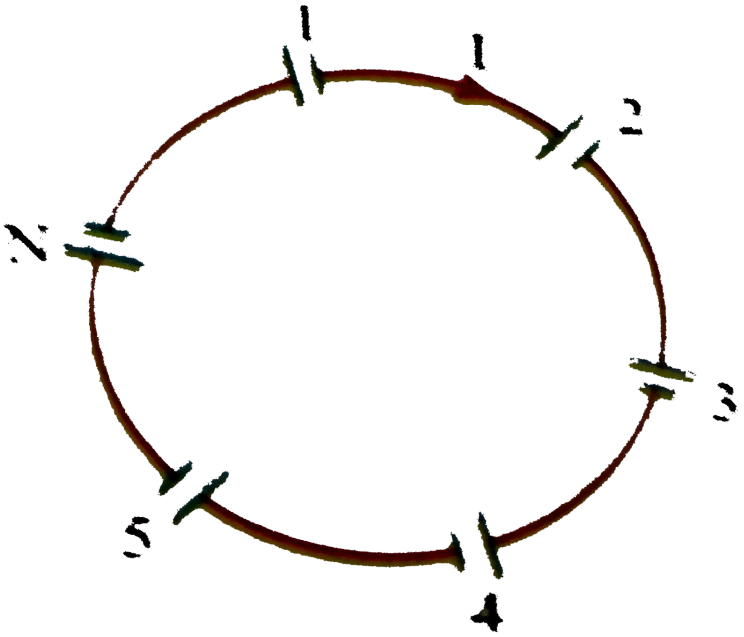

3.

A group of N cells where e.m.f. varies directly with the internal resistance as per the equation $E_N = 1.5r_N$ are connected as shown in the figure. The current I in the circuit is:

A. 0.51amp

B. 5.1amp

C. 0.15amp

D. 1.5amp

Answer: D

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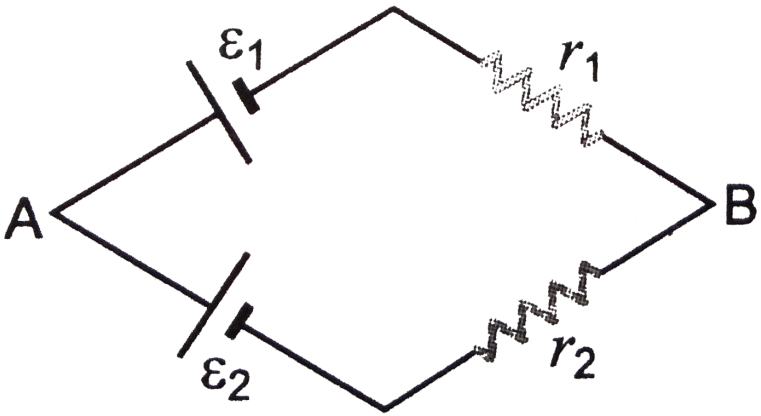
4. Two batteries of emf ε_1 and $\varepsilon_2(\varepsilon_2 > \varepsilon_1$ and internal resistances r_1 and r_2 respectively are

connected in parallel as shown in Fig. 2 (EP).1.



A. Two equivalent emf ε_{eq} of the two cells is between ε_1 and ε_2.ie. $\varepsilon_1 < \varepsilon_{eq} < \varepsilon_2$

B. The equivalent emf e_{eq} is smaller than ε_1

C. The $\varepsilon_{eq} = \varepsilon_1 + \varepsilon_2$ always

D. ε_{eq} is independent of internal resistance r_1 and r_2

Answer: A

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5. Twelve cells each having the same e.m.f are connected in series and are kept to a closed box. Some of the cell are connected in reverse order .The battery is connected in series with an ammeter an external resistance R and two cells of the same type as an in the battery .The current when they and support each other is 3 ampere and current is 2 ampare when the two

oppose each other. How many cells are connected in reverse order ?

A. 4

B. 1

C. 3

D. 2

Answer: B

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6. A battery of 24 cells each of emf 1.5 V and internal resistnace 2Ω is to be connected in order to send the maximum current through a 12Ω resistor. The correct arrangement of cells will be

A. 2 rows of 12 cells connected in parallel

B. 3rows of 8 cells connected in parallel

C. 4 rows of 6 cells connected in parallel

D. All of these

Answer: A

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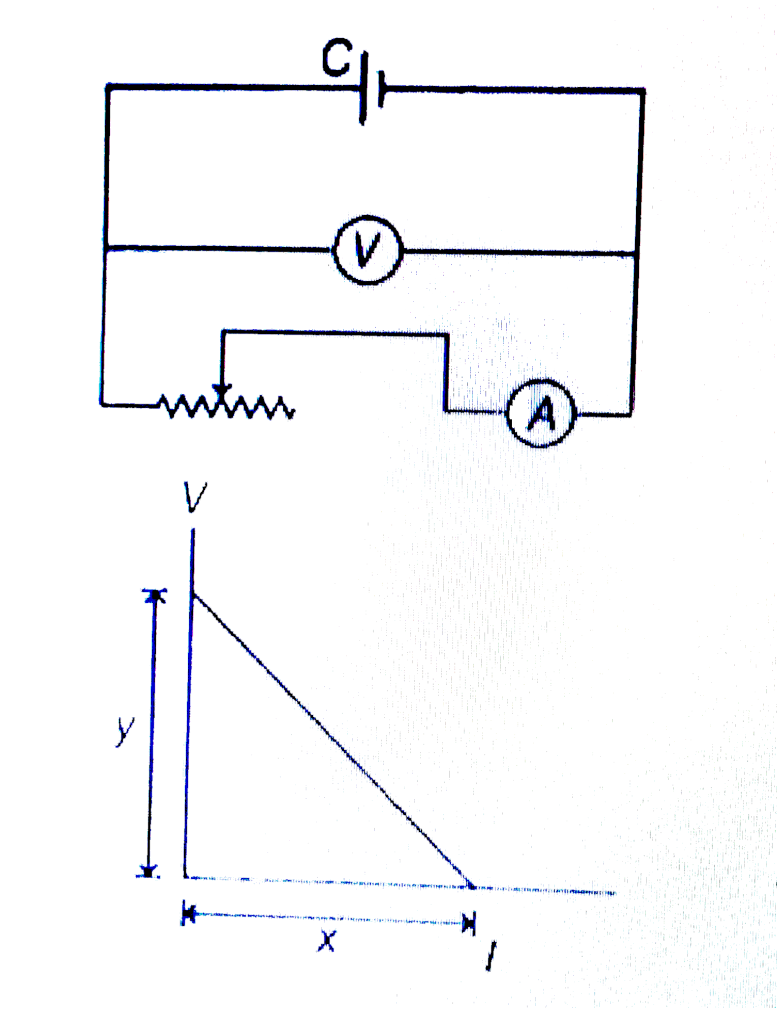
7. The diagram shows a circuit used in an experiment to determine the emf and internal resistance of the cell C. A graph was plotted of the potential difference V between the terminals of the cell against the current I, which was varied by adjusting the rheostat.

What is the internal resistance of the cell?



A. xy

B. y/x

C. x/y

D. (x-y)

Answer: B

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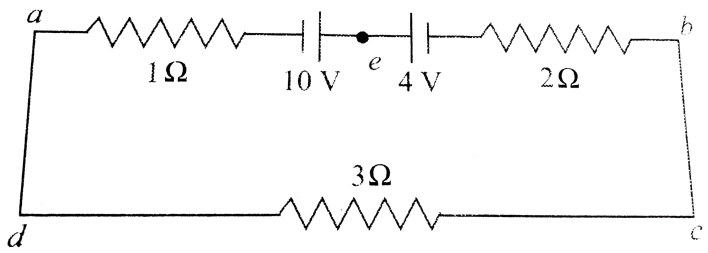
8. In the circuit shown in fig. the magnitdues and the direction of the flow of current,

respectively, would be



A. 7/3 A from a to b through c

B. 7/3 A from b to a through c

C. 1 A from b to a through c

D. 1A from a to b through c

Answer: B

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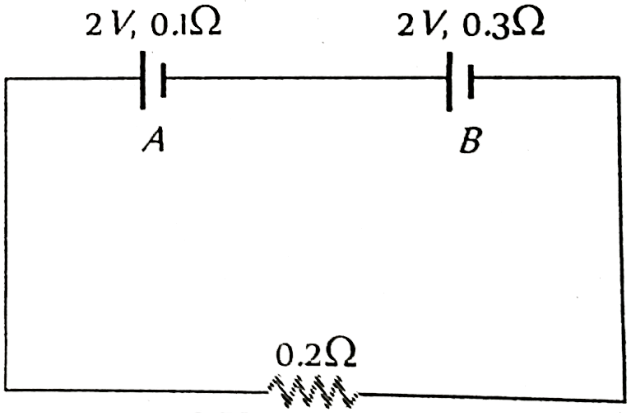
9. The internal resistances of two cells shown are 0.1Ω and 0.3Ω. If $R = 0.2\Omega$, its potential difference across the cell



A. B will be zero

B. A will be zero

C. A and B will be 2V

D. A will be gt 2V and B will be lt 2V

Answer: D

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10. Two cells,Having the same e.m.f., are connected in series through an external resitance R.Cell have internal resistances R_1 and R_2 $(R_1 > R_2)$ respectively.When the circuit is closed,the potential difference across the first cell is zero.The value of R is:-

A. $r_1 + r_2$

B. $r_1 - r_2$

C. $\frac{r_1 + r_2}{2}$

D. $\frac{r - (1) - r_2}{2}$

Answer: A

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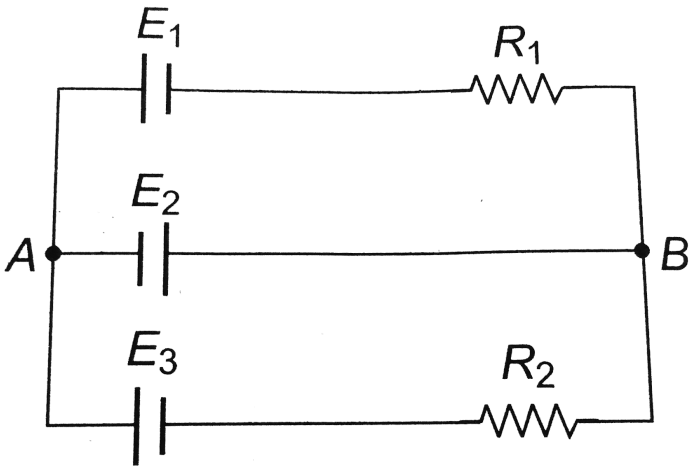
11. In the circuit shown here, $E_1 = E_2 = E_3 = 2V$ and $R_1 = R_2 = 4ohms$. The current flowing between point A and B

through battery E_2 is



A. zero

B. 2A from A to B

C. 2A from B to A

D. None of the above

Answer: B

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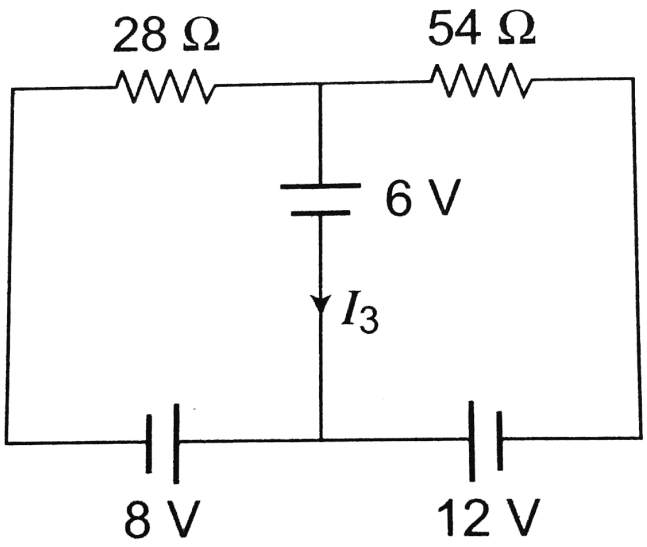
12. Consider the circuit shown in the figure. The current I_3 is equal to



A. 5A

B. 3A

C. $-3A$

D. $-\frac{5}{6}A$

Answer: D

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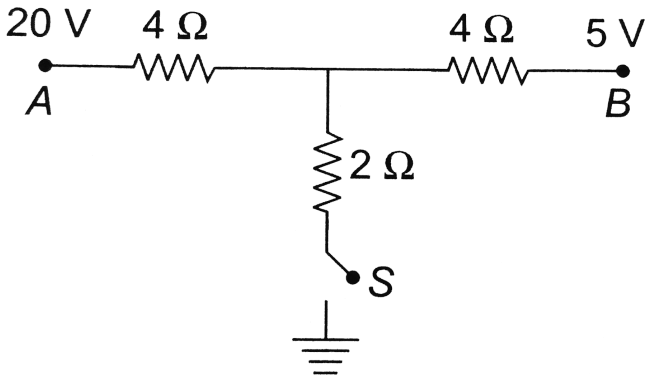
13. As the switch S is closed in the circuit shown in figure, current passed through it is.



A. 4.5A

B. 6.0A

C. 3.0A

D. Zero

Answer: C

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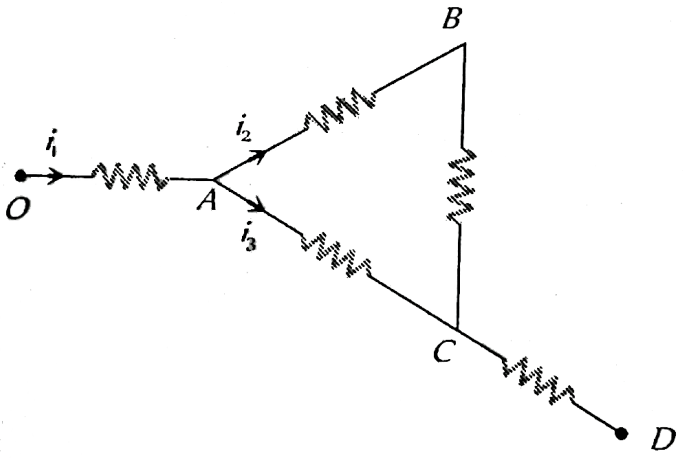
14. The current in the arm CD of the circuit will be



A. i_1

B. $i_2 + i_3$

C. $I_1 + i_3$

D. $i_1 - i_2 + i_3$

Answer: A::B

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15. Kirchoff's junction rule is a reflection of

A. conservation of current density vector

B. conservation of charge

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

D. the fact that there is no accumulation of charges at a junction

Answer: B::D

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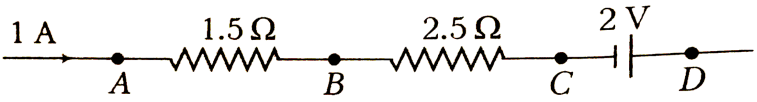
Kirchhoff S Law And Simple Circuits

1. In the circuit element given here, if the potential at point B, $V_B = 0$, then the potentials of A and D are given as ltBrgt



A. $V_A = -1.5V, V_D = +2.5V$

B. $V_A = +1.5V, V_D = +2.5V$

C. $V_A = +1.5V, V_D = +0.5V$

D. $V_A = +1.5V, V_D = -0.5V$

Answer: D

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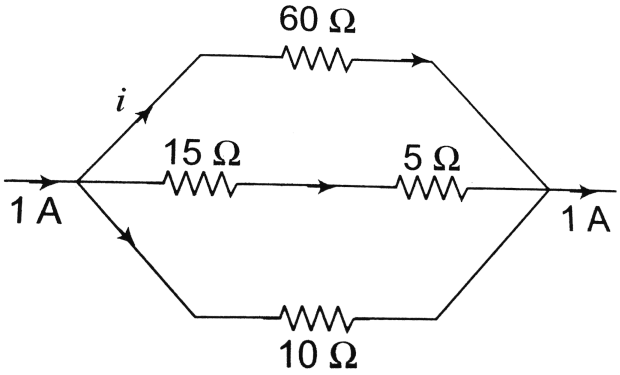
2. The magnitude in i in ampere unit is



A. 0.1

B. 0.3

C. 0.6

D. None of these

Answer: A

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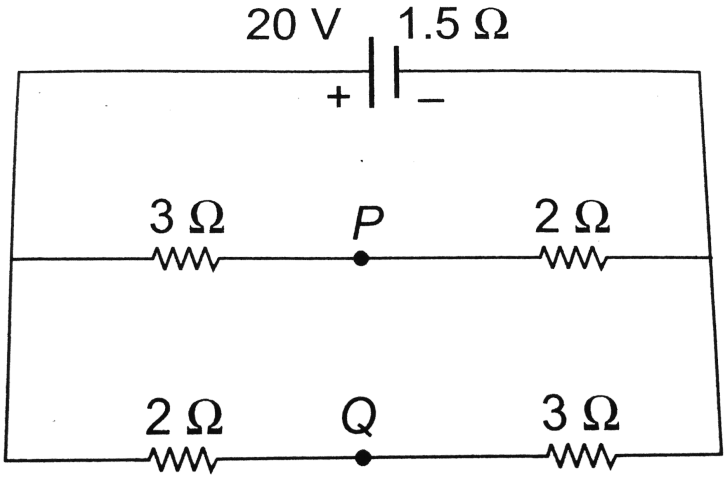
3. If in the circuit shown below, the internal resistance of the battery is 1.5Ω and V_P and V_Q are the potential at P and Q respectively, what is the potential difference between the

point P and Q?



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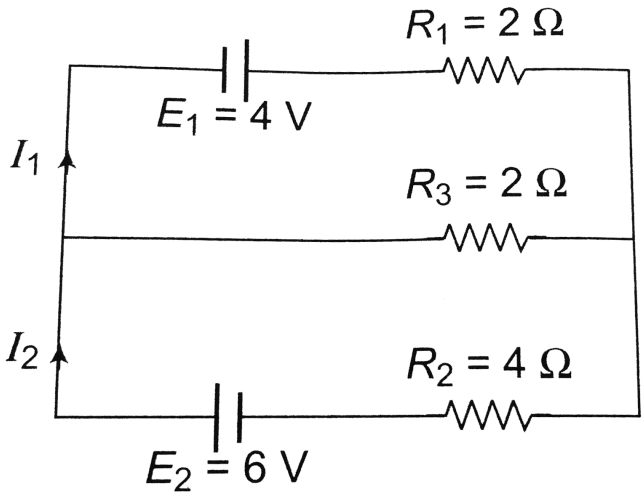
4. In the circuit shown below

$E_1 = 4.0V, R_1 = 2\Omega, E_2 = 6.0V, R_2 = 4\Omega$

and $R_3 = 2\Omega$. The current I_1 is



A. 1.6A

B. 1.8A

C. 1.25A

D. 1.0A

Answer: B

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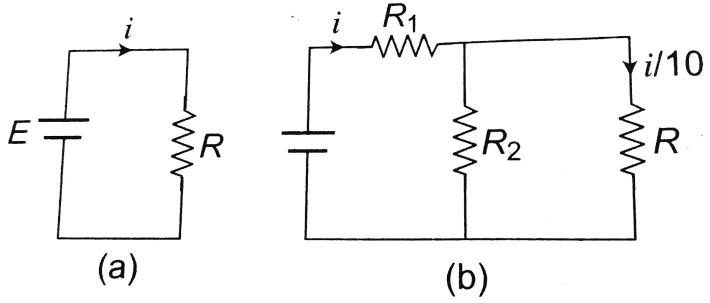
5. Consider the circuit shown in the figure. Both the circuits are taking same current from battery but current through R in the second circuit is $\frac{1}{10}th$ of current through R in the first circuit. If R is 11Ω, the value of R_1



A. 9.9Ω

B. 11Ω

C. 8.8Ω

D. 7.7Ω

Answer: A

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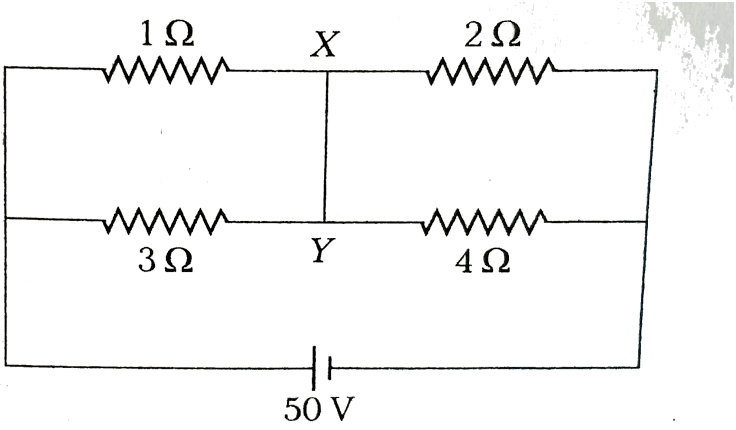
6. Current through wire XY of circuit shown is



A. 1A

B. 4A

C. 2A from B to A

D. 3A

Answer: C

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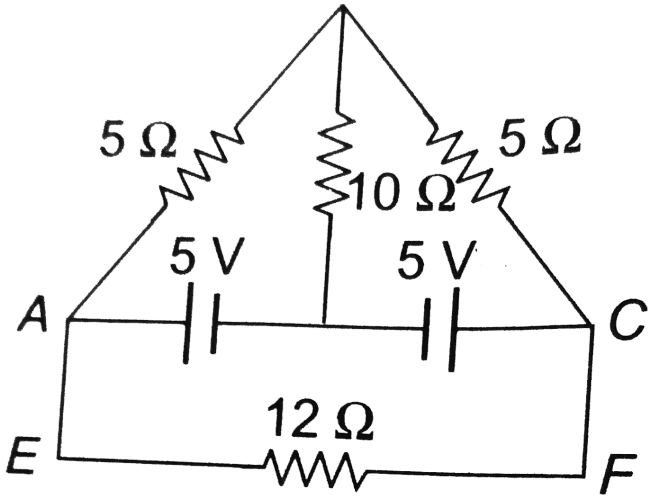
7. In the circuit of adjoining figure the current through 12Ω resister will be



A. 1A

B. 1/5A

C. 2/5A

D. 0A

Answer: D

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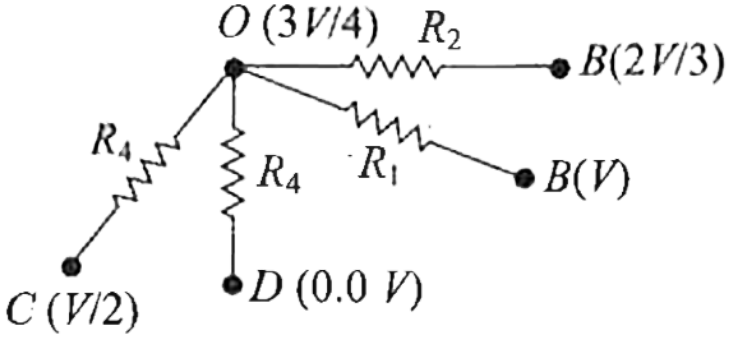
8. The circuit is shown in the following figure. The potential at points A, B, C, D and O are given. The currents in the resistance R_1, R_2 and R_3 are in the ratio of $4:2:1$. What is the

ratio of resistance R_1, R_2, R_3 and R_4 ?



A. $3:2:12:16$

B. $2:3:36:12$

C. $4:3:12:32$

D. $3:4:14:32$

Answer: A

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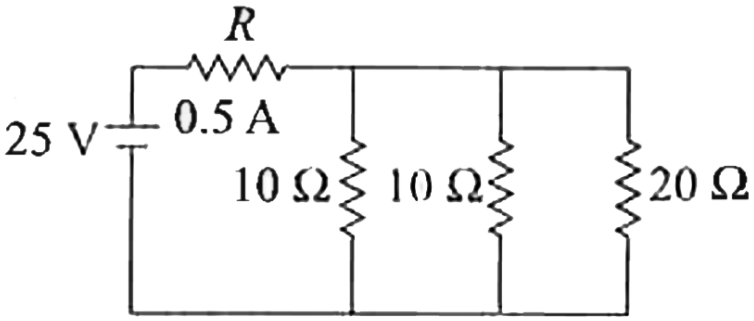
9. In the circuit as shown if the current drawn through battery is $0.5A$. Then



A. Resistance R = 46Ω

B. Current through 20Ω resistance is 0.1A

C. Potential difference across the middle resistance is 2V

D. Potential difference across the 20Ω resistance is 4V

Answer: A::B::C

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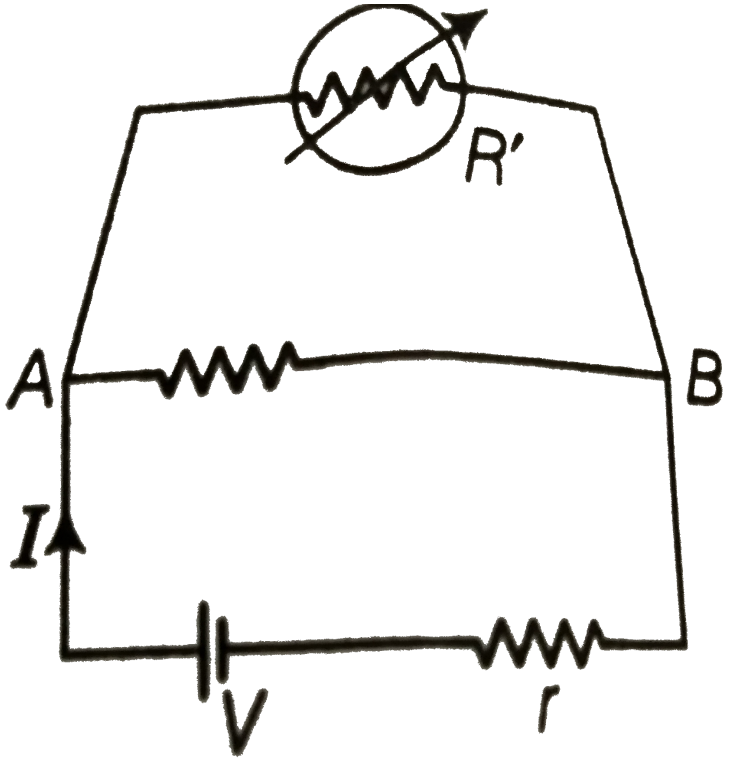

10.

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 $(r << R << R)$.

A. Potential drop across AB is nealry constant as R' is varied

B. Current through R' is nearly a constant as R' is varied

C. Current I depends sensitivity on R'

D. $I \geq \left(\frac{V}{r+R} \right)$ always

Answer: A::D

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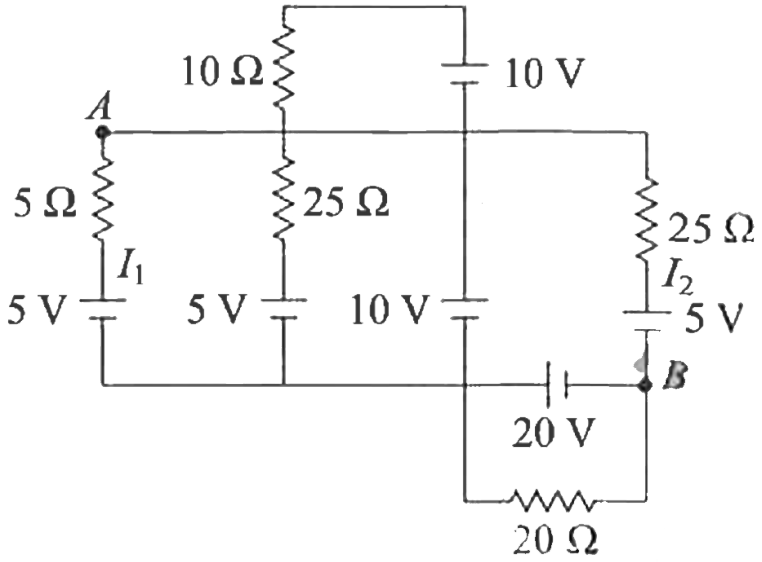
11. The circuit consists of resistors and ideal cells. I_1 and I_2 are current through branches indicated in the figure, V_A and V_B is the potential at points A and B on the circuit



The value of $\frac{I_2}{I_1}$ is:

A. 1

B. 2

C. 3

D. 4

Answer: A

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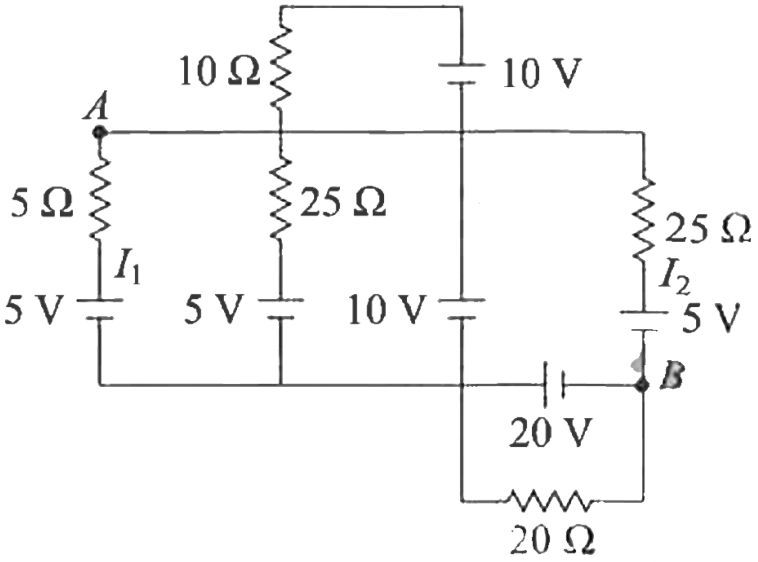
12. The circuit consists of resistors and ideal cells. I_1 and I_2 are current through branches indicated in the figure, V_A and V_B is the potential at points A and B on the circuit



The value of $V_A - V_B$ in volts is:

A. 5

B. 10

C. 15

D. 30

Answer: D

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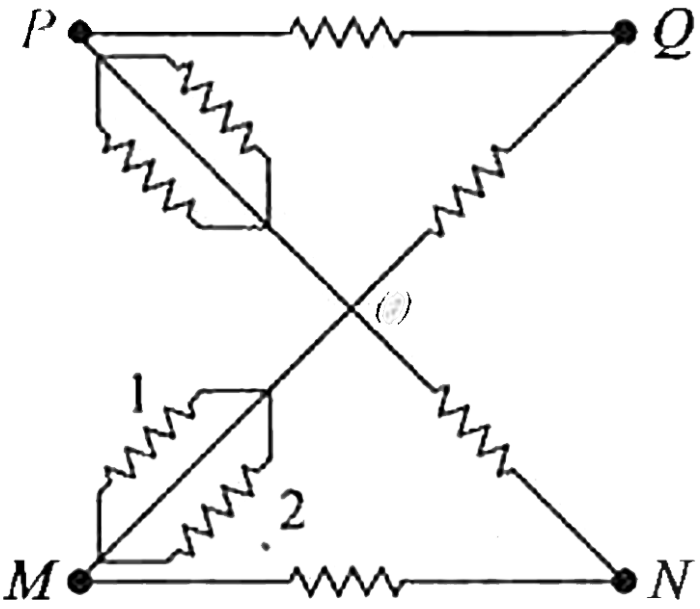
13. In the given circuit, if resistance of each resistor is R:



Find the equivalent resistance between M and N,

A. 5/2R

B. 5R

C. $\left(\frac{31}{10}\right)R$

D. $\left(\frac{3}{5}\right)R$

Answer: D

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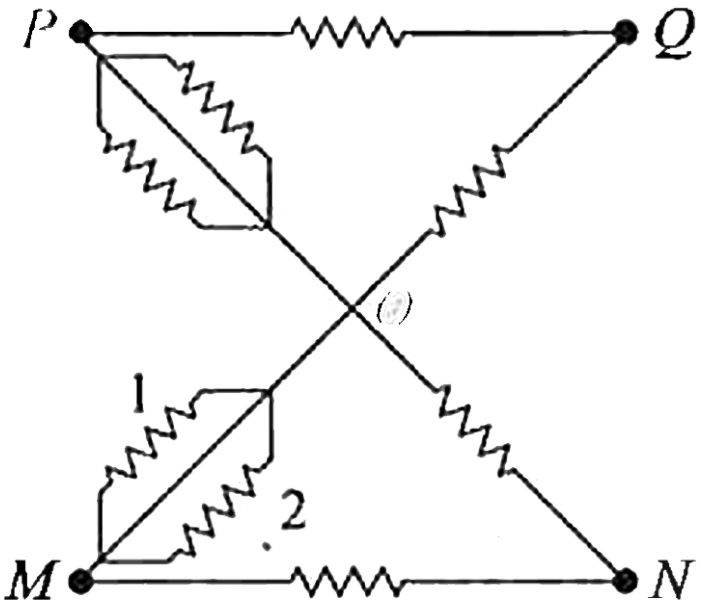
14. In the given circuit, if resistance of each resistor is R:



How much current will flow through resistor 1, if current entered at M is I:

A. $\frac{I}{5}$

B. $2\frac{l}{5}$

C. $3\frac{I}{5}$

D. $4\frac{I}{5}$

Answer: A

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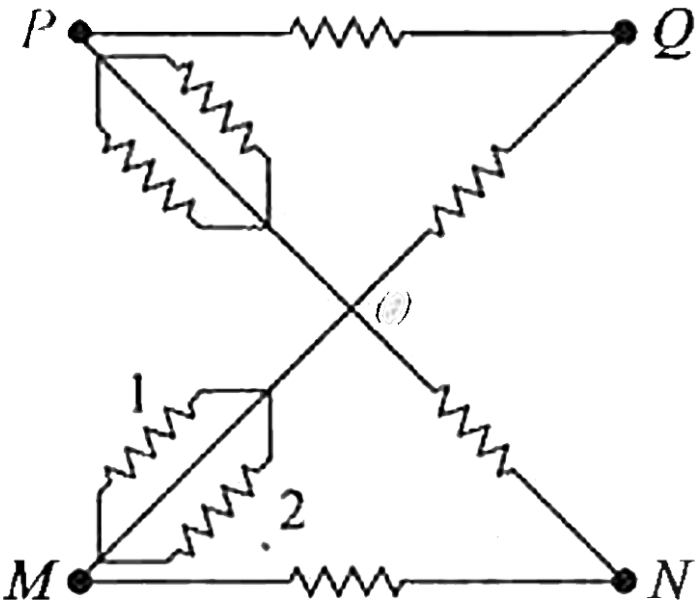
15. In the given circuit, if resistance of each resistor is R:



The equivalent resistance between M and Q.

A. $\frac{R}{2}$

B. $\frac{R}{3}$

C. R

D. 2R

Answer: C

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