1.

A battery of emf of 4V gives a current of 0.2A when connected across a wire of resistance 18Ω. the inter

1. 1Ω
2. 2Ω
3. 4Ω
4. 20Ω

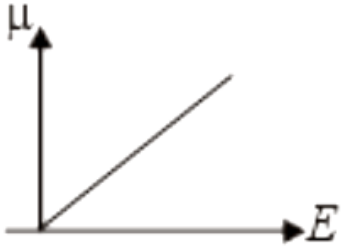
2.

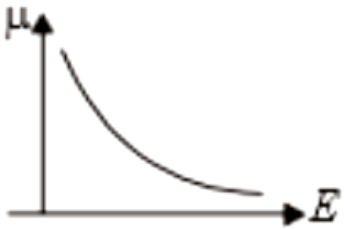
If a resistance coil is made by joining in parallel two resistances each of 20Ω. An emf of 2V is applied across this coil for 100 seconds. The heat produced in the coil is

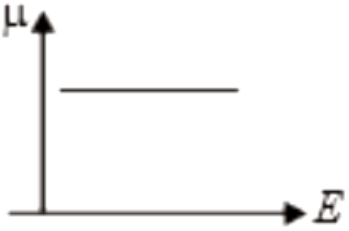
1. 20 J
2. 10 J
3. 40 J
4. 80 J

3.

Which of the following graphs correctly represents the variation of mobility (μ) of electrons with applied

1. 

2. 

3. 

4. 

4.

The drift velocity of the electron in a current-carrying metallic conductor is of the order of

1. 10^{4} m/s
2. 10^{8} m/s
3. 10^{0}m/s
4. 10^{-4}m/s

5.

If I be the current limit of a fuse wire of length ℓ and radius r, then select the appropriate relation

1. $I \propto \ell$
2. $I \propto r^2$
3. $I \propto \ell^0$
4. $I \propto r^0$

6.

The sensitivity of a potentiometer can be increased by

1. increasing the potential gradient
2. decreasing the length of potentiometer wire
3. decreasing the current in the potentiometer wire
4. all of these

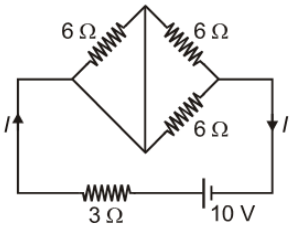
7.

Three copper wires have their lengths in the ratio 5 : 3 : 1 and their masses are in the ratio 1 : 3 : 5 Their electrical resistance will be in the ratio of :

1. 5 : 3 : 1
2. 1 : 3 : 5
3. 125 : 15 : 1
4. 1 : 15 : 125

8.

Current I as shown in the circuit will be



1. 10 A
2. $\frac{20}{3}$ A
3. $\frac{2}{3}$ A
4. $\frac{5}{3}$ A

9.

The current in a wire varies with time according to the relation i=(3+2t)A. The amount of charge pass a cross section of the wire in the time interval t=0 and t=4.0 sec would be (where t is time in

seconds)

1. 28 C
2. 30.5 C
3. 8 C
4. 82 C

10.

When the length and area of cross-section both are doubled, then its resistance

(1) Will become half

(2) Will be doubled

(3) Will remain the same

(4) Will become four times

11.

A metallic block has no potential difference applied across it, then the mean velocity of free electrons is (T = absolute temperature of the block)

(1) Proportional to T

(2) Proportional to $\sqrt{T}$

(3) Zero

(4) Finite but independent of temperature

12.

An electric wire of length 'l' and area of cross-section a has a resistance R *ohm*s. Another wire of the same material having same length and area of cross-section 4a has a resistance of

(1) 4R

(2) R/4

(3) R/16

(4) 16R

13.

A wire of radius r has resistance R. If it is stretched to a radius of $\frac{3r}{4}$, its resistance becomes

(1) $\frac{9R}{16}$

(2) $\frac{16R}{9}$

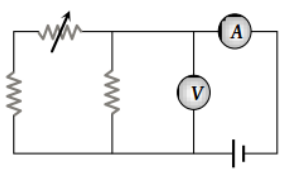
(3) $\frac{81R}{256}$

(4) $\frac{256R}{81}$

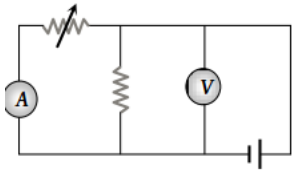
14.

Express which of the following setups can be used to verify Ohm's law

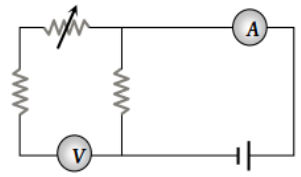
(1)



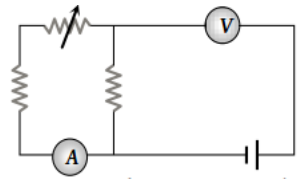
(2)



(3)



(4)



15.

What is the resistance of a carbon resistance which has bands of colours brown, black and brown

(1) 100 Ω

(2) 1000 Ω

(3) 10 Ω

(4) 1 Ω

16.

The following four wires are made of the same material and are at the same temperature. Which one of them has highest electrical resistance

(1) Length = 50 *cm*, diameter = 0.5 *mm*

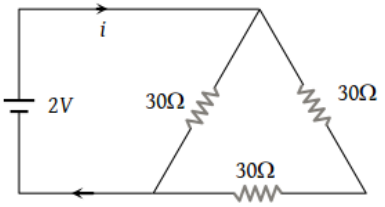
(2) Length = 100 *cm*, diameter = 1 *mm*

(3) Length = 200 *cm*, diameter = 2 *mm*

(4) Length = 300 *cm*, diameter = 3 *mm*

17.

The current in the adjoining circuit will be



(1) $\frac{1}{45} ampere$

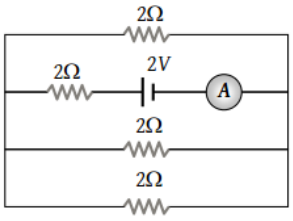
(2) $\frac{1}{15} ampere$

(3) $\frac{1}{10} ampere$

(4) $\frac{1}{5} ampere$

18.

The reading of the ammeter as per figure shown is



(1) $\frac{1}{8}A$

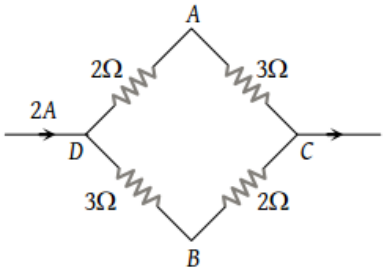
(2) $\frac{3}{4}A$

(3) $\frac{1}{2}A$

(4) 2 *A*

19.

A current of 2 A flows in a system of conductors as shown. The potential difference $(V_A - V_B)$ will be



(1) +2 *V*

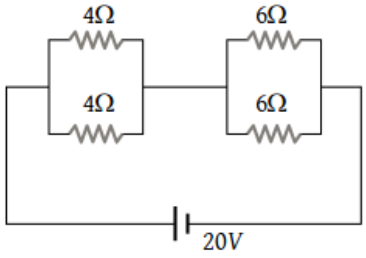
(2) +1 *V*

(3) –1 *V*

(4) –2 *V*

20.

Four resistances are connected in a circuit in the given figure. The electric current flowing through 4 *ohm* and 6 *ohm* resistance is respectively



(1) 2 *amp* and 4 *amp*

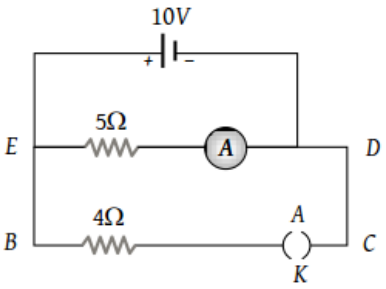
(2) 1 *amp* and 2 *amp*

(3) 1 *amp* and 1 *amp*

(4) 2 *amp* and 2 *amp*

21.

In the given figure, when key *K* is opened, the reading of the ammeter *A* will be



(1) 50 *A*

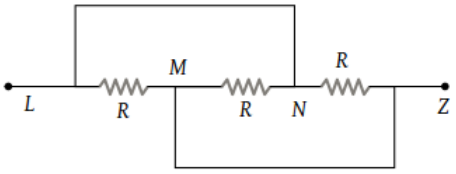
(2) 2 *A*

(3) 0.5 *A*

(4) $\frac{10}{9}A$

22.

Three equal resistances each of value *R* are joined as shown in the figure. The equivalent resistance between *M* and *N* is



(1) *R*

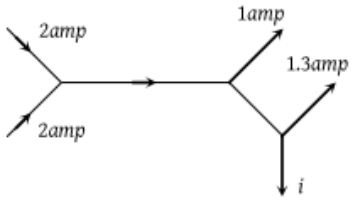
(2) 2*R*

(3) $\frac{R}{2}$

(4) $\frac{R}{3}$

23.

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



(1) 1.7 *amp*

(2) 3.7 *amp*

(3) 1.3 *amp*

(4) 1 *amp*

24.

For measurement of potential difference, potentiometer is preferred in comparison to voltmeter because

(1) Potentiometer is more sensitive than voltmeter

(2) The resistance of potentiometer is less than voltmeter

(3) Potentiometer is cheaper than voltmeter

(4) Potentiometer does not take current from the circuit

25.

In order to pass 10% of main current through a moving coil galvanometer of 99 *ohm*, the resistance of the required shunt is

(1) 9.9 Ω

(2) 10 Ω

(3) 11 Ω

(4) 9 Ω

26.

A galvanometer can be used as a voltmeter by connecting a

(1) High resistance in series

(2) Low resistance in series

(3) High resistance in parallel

(4) Low resistance in parallel

27.

A potentiometer is used for the comparison of e.m.f. of two cells E_1 and E_2. For cell E_1 the no deflection point is obtained at 20*cm* and for E_2 the no deflection point is obtained at 30*cm*. The ratio of their e.m.f.'s will be

(1) 2/3

(2) 1/2

(3) 1

(4) 2

28.

Two cells when connected in series are balanced on 8*m* on a potentiometer. If the cells are connected with polarities of one of the cell is reversed, they balance on 2*m*. The ratio of e.m.f.'s of the two cells is

(1) 3 : 5

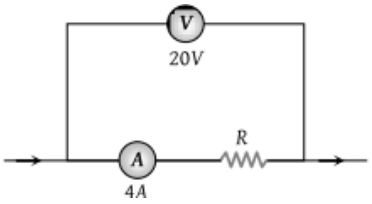
(2) 5 : 3

(3) 3 : 4

(4) 4 : 3

29.

In the diagram shown, the reading of voltmeter is 20 *V* and that of ammeter is 4 *A*. The value of *R* should be (Consider given ammeter and voltmeter are not ideal)



(1) Equal to 5 Ω

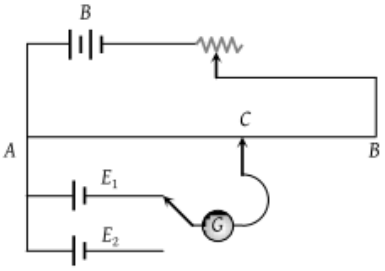
(2) Greater from 5 Ω

(3) Less than 5 Ω

(4) Greater or less than 5 Ω depends on the material of *R*

30.

The circuit shown here is used to compare the e.m.f. of two cells E_1 and $E_2(E_1 > E_2)$. The null point is at *C* when the galvanometer is connected to E_1. When the galvanometer is connected to E_2, the null point will be



(1) To the left of *C*

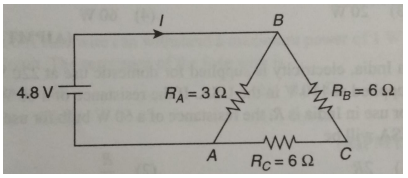
(2) To the right of *C*

(3) At *C* itself

(4) Nowhere on *AB*

31.

The current (I) in the given circuit is



1. 1.6 A

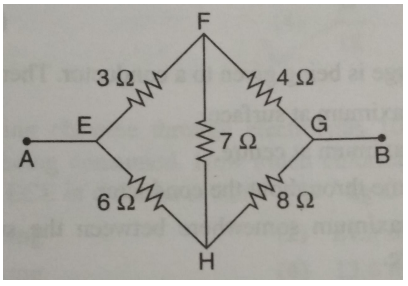
2. 2 A

3. 0.32 A

4. 3.2 A

32.

A bridge circuit is shown in figure the equivalent resistance between A and B will be



1. 21Ω

2. 7Ω

3. $\frac{252}{85}$

Ω

4. $\frac{14}{3}\Omega$

33.

A cell has an emf 1.5 V. When connected across an external resistance of 2Ω the terminal potential difference falls to 1.0 V the internal resistance of the cell is

1. 2Ω
2. 1.5Ω
3. 1.0Ω
4. 0.5Ω

34.

Two 220 V, 100W bulbs are connected first in series and them in parallel. Each time the combination is connected to a 220 V AC supply line. The power drawn by the combination in each case respectively will be

1. 50W, 100W
2. 100W, 50W
3. 200W, 150W
4. 50W, 200W

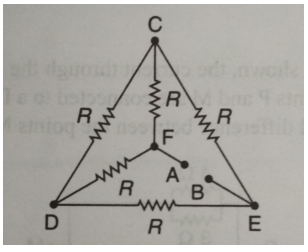
35.

A battery is charged at a potential of 15V for 8h when the current flowing is 10A. The battery on discharge supplies a current of 5A for 15h. The mean terminal voltage during discharge is 14V. The 'watt-hour' efficiency of the battery is

1. 80%
2. 90%
3. 87.5%
4. 82.5%

36.

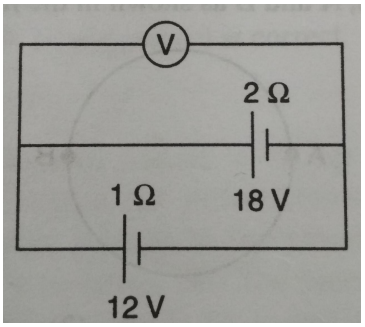
Five equal resistances each of resistance R are connected as shown in the figure. A battery of V volts is connected between A and B. The current flowing in AFCEB will be



1. $\frac{V}{R}$
2. $\frac{V}{2R}$
3. $\frac{2V}{R}$
4. $\frac{3V}{R}$

37.

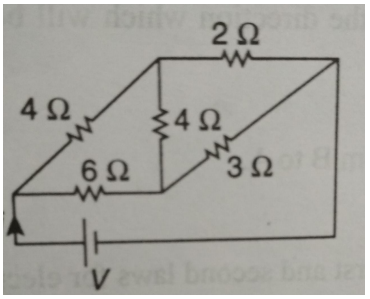
Two batteries, one of emf 18 V and internal resistance 2Ω and the other of emf 12 V and internal resistance 1Ω, are connected as shown. The voltmeter V will record a reading of



1. 18 V
2. 30 V
3. 14 V
4. 15 V

38.

For the network shown in the figure, the value of the current i is



1. $\frac{18V}{5}$
2. $\frac{5V}{9}$
3. $\frac{9V}{35}$
4. $\frac{5V}{18}$

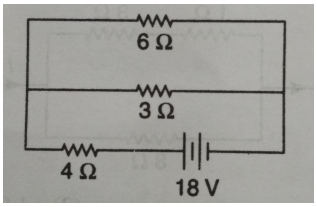
39.

Two cells, having the same emf, are connected in series through an external resistance R. Cells 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

1. $r_1 - r_2$
2. $\frac{r_1+r_2}{2}$
3. $\frac{r_1-r_2}{2}$
4. $r_1 + r_2$

40.

The total power dissipated in Watts in the circuit shown here is



1. 4
2. 16
3. 30
4. 54

41.

An electric kettle takes 4A current at 220 V. How much time will it take to boil 1kg of water from temperature $20^{\circ}\mathrm{C}$? The temperature of boiling water is $100^{\circ}\mathrm{C}$.

1. 4.2 min
2. 6.3 min
3. 8.3 min
4. 12.6 min

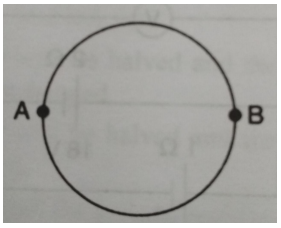
42.

A cell can be balanced against 110 cm and 100 cm of the potentiometer wire, respectively with and without being short circuited through a resistance of 10Ω. Its internal resistamce is

1. zero
2. 1.0Ω
3. 0.5Ω
4. 2.0Ω

43.

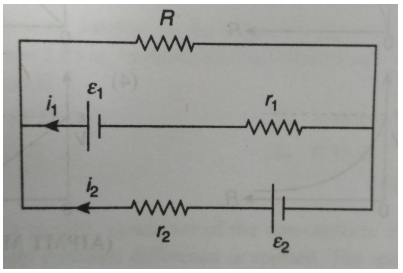
A wire of resistance 12 W m^{-1} is bent to form a complete circle of radius 10 cm. The resistance between its two diametrically opposite points, A and B as show in figure is



1. 3Ω
2. $6\pi\Omega$
3. 6Ω
4. $0.6\pi\Omega$

44.

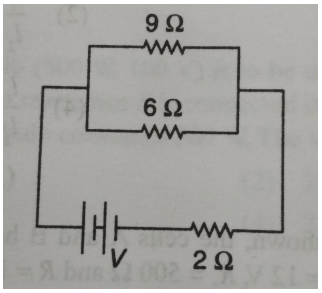
See the electrical circuit shown in the figure below. Which of the following equations is a correct equation for it?



1. $\varepsilon_2 - \mathrm{i}_2\mathrm{r}_2 - \varepsilon_1 - \mathrm{i}_1\mathrm{r}_1 = 0$
2. $-\varepsilon_2 - (\mathrm{i}_1 + \mathrm{i}_2)\mathrm{R} + \mathrm{i}_2\mathrm{r}_2 = 0$
3. $\varepsilon_1 - (\mathrm{i}_1 + \mathrm{i}_2)\mathrm{R} + \mathrm{i}_1\mathrm{r}_1 = 0$
4. $\varepsilon_1 - (\mathrm{i}_1 + \mathrm{i}_2)\mathrm{R} - \mathrm{i}_1\mathrm{r}_1 = 0$

45.

If the power dissipated in the 9Ω resistor in the circuit shown in 36 W, the potential difference across the 2Ω resistor is



1. 2V
2. 4V
3. 8V
4. 10V

Fill OMR Sheet