PHYSICS
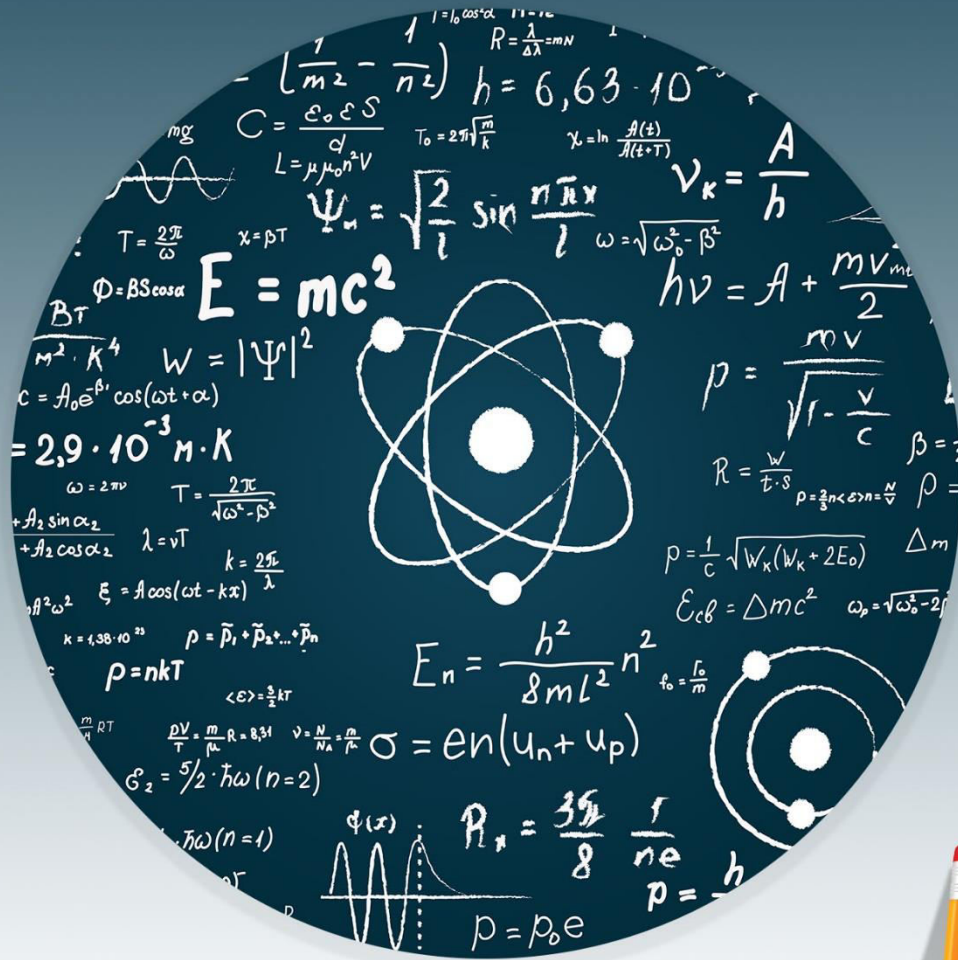
WORKSHEET-3

Worksheet-03

Topics:- Current, Ohm's Law, Specific resistance, Effect of temperature on resistance, Temperature coefficient of resistance

Q.1 **The graphical representation of ohm's law is:**
A) Hyperbola   C) Parabola
B) Ellipse   D) Straight Line

Q.2 **ohm is defined as:**
A) volt / ampere   C) ampere / volt
B) volt / coulomb   D) joule / coulomb

Q.3 **The resistance of a meter cube of the substance is called:**
A) Resistivity   C) Permittivity
B) Conductivity   D) None of these

Q.4 **The S.I unit of resistivity is:**
A) ohm-m   C) ohm-m^3
B) ohm-m^2 D) ohm-cm

Q.5 **When the resistances are connected in series the equivalent resistance is equal to?**
A) Sum of the reciprocal of the individual resistances
B) Sum of individual resistances
C) Product of the individual resistances
D) Can't be predicted

Q.6 **The potential difference across resistances in series combination is:**
A) Always same   C) May be same or different
B) Always different   D) None of these

Q.7 **Three resistances 500 ohm, 350 ohm and 500 ohm are connected in series the equivalent resistance will be:**
A) 1300 Ω   C) 650 Ω
B) 1350 Ω   D) 1400 Ω

Q.8 **In the circuit shown**

$R_1 = 4\Omega$
$R_3 = 6\Omega$
A
G
$R_2 = 4\Omega$
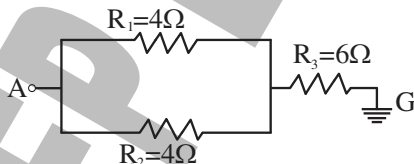
If voltage applied at A is 20 V then what would be the resultant current passing through R₃.
A) 4 A   C) 2.5 A
B) 6 A   D) 10 A

Q.9 **If a battery of 9 V is connected across 2.0 Ω resistance, then what would be the resultant current?**
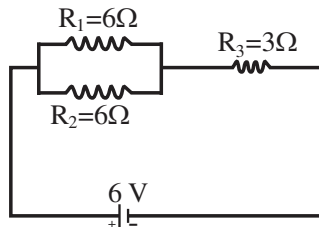A) 4.0 A   C) 3.5 A
B) 4.5 A   D) 5.0 A

Q.10 How many different resistances are possible with two equal resistors?

A) 2   C) 4

B) 3   D) 5

Q.11 Find the equivalent resistance of the circuit:

$R_1=6\Omega$

$R_3=3\Omega$

$R_2=6\Omega$

6 V

A) 3 Ω C) 6 Ω

B) 12 Ω D) 4 Ω

Q.12 Referring to Q.11, the total current drawn from source is:

A) 0.5 A   C) 1 A

B) 2 A   D) 0.25 A

Q.13 Referring to Q.11, the current passing through R_1 is:

A) 0.5 A   C) 1 A

B) 2 A   D) 0.25 A

Q.14 Referring to Q.11, the current passing through R_2 is::

A) 0.5 A   C) 1 A

B) 2 A   D) 0.25 A

Q.15 Referring to Q.11, the current passing through R_3 is:

A) 0.5 A   C) 1 A

B) 2 A   D) 0.25 A

Q.16 2×10^6 electrons pass through a conductor in 1 ms. Find electric current flowing through conductor:

A) 32×10^{-9} A   C) 3.2×10^{-10} A

B) 32×10^{-10} A   D) 0.32×10^{-10} A

Q.17 A carbon resistor is connected to a battery of 50 V and 2 A current is passing through it. If voltage is increases to 75 V, the current will become:

A) 3 A   C) 4.5 A

B) 1.5 A   D) 6 A

Q.18 If the resistance of each resistor is 10 ohm in the following figure, then what will be the effective resistance between points 'A' and 'B':
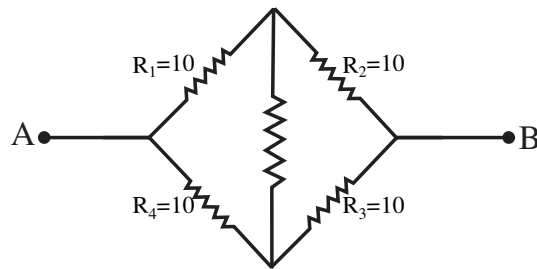
A) 40 ohm   C) 30 ohm
B) 50 ohm   D) 10 ohm

Q.19   **The ratio of effective resistances of two identical resistors, first connected in series then in parallel is:**
A) 1:2   C) 4:1
B) 2:1   D) 1:4

Q.20   **A wire carrying electronic current is:**
A) Negatively charged   C) Electrically neutral
B) Positively charged   D) Any of these

ANSWER KEY (Worksheet-03)			
1	D	11	C
2	A	12	C
3	A	13	A
4	A	14	A
5	B	15	C
6	C	16	C
7	B	17	A
8	C	18	D
9	B	19	C
10	B	20	C

SOLUTIONS

Unit – 7 (WS-03)

Q.1   Answer is "D"

Solution:- Graph of ohm's law is between "V" and "I". Since $V \propto I$, so, graph is straight line inclined with "V-axis".

Q.2   Answer is "A"

Solution:- By ohm's law:

$$R = \frac{V}{I}$$

$$1 \text{ ohm} = \frac{1 \text{ volt}}{1 \text{ ampere}}$$

Q.3   Answer is "A"

Solution:- Resistivity of material of wire is defined as:

$$\rho = \frac{RA}{L} \quad \rho = \frac{R(1 \text{ m}^2)}{(1 \text{ m})}$$

Q.4   Answer is "A"

Solution:- By formula

$$\rho = \frac{RA}{L} = \frac{\Omega \text{ m}^2}{\text{m}} = \Omega \text{ m}$$

Q.5   Answer is "B"

Solution:- $R_e = R_1 + R_2 + R_3 + \ldots \ldots$

Q.6   Answer is "C"

Solution:- If resistances are same then potential is also same, otherwise it is different.

Q.7   Answer is "B"
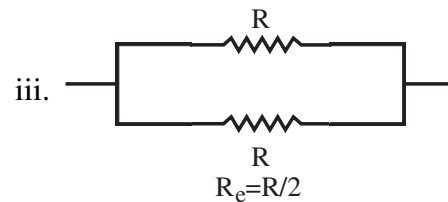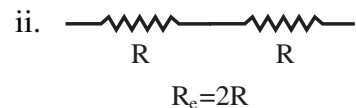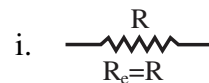
Solution:- $R_e = R_1 + R_2 + R_3$

Q.8   Answer is "C"

Solution:- $I = \dfrac{V}{R_e}$

Q.9   Answer is "B"

Solution:- $I = \dfrac{V}{R}$

Q.10   Answer is "B"

Solution:- By two resistors of equal value, following different resistances can be obtained:

i.
$R_e = R$

ii.
$R_e = 2R$

iii.
$R_e = R/2$

Q.11   Answer is "C"

Solution:- $R_e = (R_1 \parallel R_2) + R_3$

Q.12   Answer is "C"

Solution:- $V = I R_e$

Q.13   Answer is "A"

Solution:- $I_1 = \left(\dfrac{R_2}{R_1 + R_2} \right) I$

Q.14   Answer is "A"

Solution:- $I_2 = \left(\dfrac{R_1}{R_1 + R_2}\right)I$

Q.15   Answer is "C"

Solution:- $I_3 = I_1 + I_2$

Q.16   Answer is "C"

Solution:-

Use:

$I = \dfrac{Q}{t} = \dfrac{ne}{t}$

Q.17   Answer is "A"

Solution:-

Initially

$V = IR$

$R = \dfrac{V}{I} = \dfrac{50}{2} = 25\ \Omega$

After increasing voltage

$I' = \dfrac{V'}{R} = \dfrac{75}{25} = 3\,A$

Q.18   Answer is "D"

Solution:-

$R_{AB} = (10+10)\,\|\,(10+10)$

Q.19   Answer is "C"

Solution:-

$R_s = nR$

$R_P = \dfrac{R}{n}$

Taking ratio

$\dfrac{R_s}{R_P} = \dfrac{nR}{\dfrac{R}{n}} = n^2$

Q.20   Answer is "C"

Solution:-

Any current carrying object is electrically neutral.

STEP

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