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Peter Handke

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EDITORIAL

Dear learners,

Learning is a continuous process, which involves thinking, articulating, storing, remembering, using, parting and so on. Everyone learns, relearns and unlearns. It becomes an asset for the life. This can never be stolen and it cannot be bought too. It can only be gained. There are lots of ways by which one attains knowledge. What one attains, becomes ornament that shines and is part of one's own life. This is what makes one's life fruitful. To be fruitful one needs to be laborious. If one has gained something through easy means that will not sustain for a long period of time. Therefore, be a learner to be productive member of the society to think, to articulate, to store, to remember, to use, to impart by equipping oneself with the required skills. Proper learning creates lot of opportunities and these would lead to dispel the ignorance and would light up knowledge.

To be a help by being by your side to make your labour easy, we are presenting our humble effort in the form of a magazine named 'EDUMATE'. This is a collective endeavour to reach to the aspirants to make the study easier and also to let you know the day to day affairs. We have tried our level best to incorporate everything required to make a student's study process easy and effective. If our efforts stand helpful for your studies then the herculean task that we started will be fruitful.

No doubt this creative endeavour will bring about an array of knowledge bearing sweetest fruit ever. Let the knowledge sown today bring forth its best fruit with the help of 'EDUMATE'.

To you from us with love...

Geo John
Chief Editor

Life ... Love... Learn... to be a Change



FR. SIJU JOHN, M.A., M.Ed.

‘You must be the change you wish to see in the world’, one of the perfect words of Gandhiji in this new modern fast moving world when everyone wants to perceive changes and fetch changes in the life of others but not in oneself. We call for changes in life and no one would like to be idle in his/her life. We do apply certain words often in our conversation and they are life, love and learn.

LIFE.....

“Twenty years from now you will be more disappointed by the things you didn’t do than by the ones you did do. So throw off the bowlines. Sail away from the safe harbor. Catch the trade winds in your sails. Explore, Dream, Discover.” – Mark Twain.

The American writer’s words about life have a lot of relevance for today’s young buds. Life is to be explored in all meaning. It’s not a free gift but heavily compensated by our dear parents, our visible gods on earth. Every player has a coach but the coach is not always a better player. We have to explore ourselves and to explore we need to dream and discover. Every unearthing initiate with a dream and a better dreamer discovers better. Discovery begins from within and why don’t we take a step forward; a step which is rare, bold and distinctive.

LOVE

“Love is an untamed force. When we try to control it, it destroys us. When we try to imprison it, it enslaves us. When we try to understand it, it leaves us feeling lost and confused.” Paulo Coelho

The Brazilian novelist says that the love is a force. The force, which comes from the heart, penetrates the hearts of others and is the germ of life. It cultivates the worth of life and our young buds have to get the imprint of this precious germ. Today the world is more educated but has less common sense, more degrees but has less capacity of judgment, bigger houses but has small families, big personalities but has less character, spends a lot but has less happiness and conquered the whole world but has lost the germ of life i.e. love. We, the human beings, try to dominate but love cultivates peace which frees us from the burden and pains of life. Let our educators, parents, peer groups, friends and so on nurture the germ of life to our young buds. We can cultivate it by giving a feather touch of love.



LEARN

‘By three methods we may learn wisdom: First, by reflection, which is noblest; Second, by imitation, which is easiest; and third by experience, which is the bitterest.’ – Confucius

The Chinese philosopher says that the toughest way of learning is by experience. A blind person makes a decision after experiencing. He sees the things through his heart because only his eyes are closed not his heart/mind. We have to keep our hearts open to learn by experience and learning through heart is love. The more I read, the more I acquire but the more I love, the more I learn to live. The most precious learning is learning of the meaning of love since all learning has an emotional base. We must learn to live together than leaning various languages and sciences. The standard of living is what we have but the standard of life is what we give from our heart.

BE A CHANGE

“The secret of change is to focus all of your energy not on fighting the old, but on building the new.”-Socrates

To be a change, we need to have clarity of mind and heart and this clarity is acquired through life, love and learning. In order to be a change or revolutionary one must have the vision and heart of a giraffe. Giraffe has a small, powerful, supercharged heart that is different to that possessed by other similar animals and has a holistic vision from above. We obtain speed in life by technology but the direction has to be from a heart which has knowledge by experience. Let us direct our young buds from our experienced hearts to bring changes in their life and lives to come. Therefore we shall lead a simple life but a rich burial by the triumph of our life.

GET UP

FROM THE FALL TO WIN



GEO JOHN, M.A., B.Ed.

INTRODUCTION

The moment one thinks about one's own capabilities and is confident about the caliber, he/she will emerge as victorious. Success is the result of positivity. When a person is positive and is with wonderful courage to take up risks can taste triumph and when one is passive and do nothing productive will have a great fall and that would be irreversible. Being positive will make great things possible to those who don't stop believing in oneself, trying something new or better and learning to be different. Be inquisitive to be different, and if you want to be different you need to be different. Being inquisitive will open up to new ideas and these ideas will sprout, grow and yield fruits.

Be curious to win

It is necessary to be curious and curiosity according to Ian Leslie is a combination of intelligence, persistence and hunger for novelty, all wrapped up in one. In order to improve curiosity and wonder one needs to read widely and should follow one's interests. It is said that when you are running into something interesting, drop everything and study it. The feeling of being interested can act as a kind of neurological signal, directing us to fruitful areas of inquiry.

Be thirsty to accomplish your target

The thirst to have fruitful enquiry will lead to fill up and accomplish the target. It will also help one to polish mind with the minds or thoughts of others. One can always be benefitted with the progressive ideas of others. It simply means to consult with the experts to be experts. These ideas will either support or would leave the spark to think what is next. If your ideas can get wings using others' thoughts there is no wrong in it but one should make sure that it is productive and never be destructive.

Do not take up shortcuts

We have crippled ourselves in finding out shortcuts in every way possible. Though we have the potential source, we do not want to rely on anything that would demand time. Even any kind of information we require is to be available at our finger tips, if not, it is very difficult to pass moments. Today's generation is born to Google. In the era of Google searches, we have no problem finding the exact answer to our questions, but by chance likely to encounter information that is not specific or relevant to our question or queries. It is said that a serendipity deficit makes innovation harder, because innovation relies on unexpected collision of

knowledge and ideas. So, it is the fact that we don't exactly get the answers perfect for our questions.

Give wings to your passions

All what you do might be meaningless or absurd for the people watch you from far, but you should never allow your passion and interests to die. Once they are no more with you, then the life will be pathetic and difficult to pursue. On the go there are chances, where you might fall down many times but your passion and interests would be your help in standing on your own foot. You must keep your passion alive and no outer forces can have access on you. This must be your strength to get up from the fall. Falling down would give us experiences and these experiences are the driving forces to stand up. An ant while carrying the grain might fall down many times but it will not stop carrying grains because of the fear of falling down. Life is similar to this. If one wants to sustain life, then it is necessary to have lots of experiences of falling down and getting up. Learn lessons from every instance of your life and this would be a force to live on.

Conclusion

I am the master of my life and everything that is required to stand on my own foot it's within me. If I am able to stand to be different by being curious to win starts my auspicious time and this so called auspicious time is within and will be out of your reach if you are to search elsewhere. Do not be satisfied with the knowledge you have but equip and update yourself at every moment by not taking the shortcuts to win rather shed your perspiration for your cause. If you are determined you will never at the place where you fell but you would fly to the heights by the wings that are created by you to win always.



MY CAREER: THE PATH FINDER



SHAJU JOSEPH, M.A., M. Phil., B. Ed., MBA

Choosing a career after schooling is considered to be the most important activity in a student's life. But the question that baffles everybody is, '**What to choose?**' and '**How to choose?**' Unfortunately these questions remain unanswered in most of the children's lives. The reason...?

In a world where the children get everything 'readymade', this problem is bound to happen. In a world where the children are just taught about the price of things and not the value, this is bound to happen and in a world where the children are not taught to take up the responsibilities or face the challenges and stand on their own legs, this is bound to happen. The parents- especially our (Indian) parents are so concerned about their children's future that they want to have everything ready for them as they grow up and finally a high profile blue collar job with a fat six/ seven digit pay cheque. Once they achieve this – the parents are happy and content that their son/ daughter is well settled.

It looks good and everybody is fine with it. Moreover this is what 90% of the present generation wants. Gradually what happens is – they get fed up with the unending stress related to work, meeting the targets, satisfying the boss etc. In the struggle to keep up with the expectations of the employers and the society, they forget their family life, their children's social and emotional growth, the spouse, the parents and relations. Not only that the extreme stress makes the person mentally and physically tired. The rest of the life is spent going to the hospitals, eating loads of medicines as food etc. or to make things worse, he/ she may get into depression or even commit suicide.

How do these things happen? Was this what was envisioned? Was it the destiny / the life parents wanted the children to have?

No- Obviously No is the answer. Then Why ...? why should this happen? Let us look back to the two questions that we left behind – **What to choose? and How to choose?**

These two questions are quintessentially important because a choice that one makes at a critical point of time makes all the difference. Every apprentice searching for a happy life, should earnestly work on What to Choose- not choose what they have been told to by the parents ,

relatives or the so called well- wishers or not a career to satisfy your parents or your own social status. The choice should ultimately based on your own interests , your own passion and your own heart's desire - failing in which whatever you do will become just a job , a burden and it will never make you happy.

As we discussed, what to Choose entirely depends on your passion, love, affinity and attachment. Your parents / teachers can surely guide you or support you but make sure you be the decision maker. When you go after what you are passionate about, you are bound to enjoy what you do. It will never be a burden for you or even a 'work' for you but it will be the most interesting activity, or 'time pass' for you as you get completely involved in it. As the maxim goes 'Do what you love and Love what you do'.

In the words of Dr. A P J Abdul Kalam, 'If you do what you love, you don't need to work even a single day in your life. So it becomes imperative to make a correct choice before selecting a particular profession.'

Now let's discuss how to identify your passion, your interest or what to do with your life. I hope the following questions will help you to make the choice. Ask yourself the same/ similar questions.

- What do I enjoy doing?
- What kind of activities are fun and fulfilling for me?
- What am I good at?
- What Skills do I have to excel in what I do?
- What are my capabilities?
- What are my drawbacks and what do I do to improve upon them?
- How much time do / can I spend to sharpen my skills?
- How confident am I?
- How strong is my Intrapersonal as well as my Interpersonal skills?
- Am I willing to / able to face the challenges that emerge in this field?

If you are able to find satisfying answers to these questions, be sure that you are on the right track. Develop a strong proactive mindset and 'Never say Die' attitude and an unrelenting thirst to achieve what you value the most and it will surely make your life and you will be happy and your life will be meaningful. As Swami Vivekananda reminds us " Arise, awake and stop not until the goal is reached".



INTRODUCTION

Charge is a fundamental particles in an atom. It may be positive or negative. Like charges repel each other and unlike charges attract each other.

$$Q = ne$$

Where, Q = Charge (total)

n = No. of electrons

e = Charge on 1 electron

Current

• **Current (I):** The rate of flow of charge is called current.

$$\text{Current} = \text{Charge/Time} \Rightarrow I = Q/t$$

S. I. unit of current = Ampere (A)

$$1 \text{ A} = 1 \text{ Cs}^{-1}$$

$$1 \text{ mA} = 10^{-3} \text{ A}$$

$$1 \text{ }\mu\text{A} = 10^{-6} \text{ A}$$

Current is measured by Ammeter. Ammeter has low resistance and always connected in series. Direction of current is taken opposite to flow of electrons as electrons were not known at the time when the phenomenon of electricity was discovered first and current was considered to be flow of positive charge.

Potential Difference

• **Potential Difference (V):** Work done to move a unit charge from one point to another.

$$V = W/Q$$

• **1 Volt:** When 1 joule work is done in carrying one Coulomb charge then potential difference is 1 volt.

S. I. unit of Potential difference = Volt (V)

$$1 \text{ V} = 1 \text{ JC}^{-1}$$

• **1 Volt:** When 1 joule work is done in carrying one Coulomb charge from one point to another then potential difference between them then potential difference is 1 volt.

$$V = W/Q$$

• **Voltmeter:** It is an instrument to measure the potential difference. It has high resistance and always connected in parallel. Cell is the simplest device to maintain potential difference. Current always flow from higher potential to lower potential.

Ohm's Law

Potential difference across the two points of a metallic conductor is directly proportional to current passing through the circuit provided that temperature remains constant.

• Mathematical expression for Ohm's law

$$V \propto I$$

$$V = IR$$

R is a constant called resistance for a given metal.

Resistance (R): It is the property of a conductor to resist the flow of charges through it.

ohm (Ω): S.I. Unit of resistance

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

When potential difference is 1 V and current through the circuit is 1 A, then resistance is 1 ohm

• **Rheostat:** This variable resistance is a component used to regulate current without changing the source of voltage.

Factors on which the Resistance of a Conductor depends

• Resistance of a uniform metallic conductor is:

(i) directly proportional to the length of conductor,

(ii) inversely proportional to the area of cross-section,

(iii) directly proportional to the temperature and

(iv) depend on nature of material.

• **Resistivity (ρ):** It is defined as the resistance offered by a cube of a material of side 1m when current flows perpendicular to its opposite faces.

• **Its S.I. unit is ohm-metre (Ωm).**

Resistivity does not change with change in length or area of cross-section but it changes with change in temperature. Range of resistivity of insulators is 10^{12} to $10^{17} \Omega\text{m}$. Resistivity of alloy is generally higher than that of its constituent metals. Alloys do not oxidize (burn) readily at high temperature, so they are commonly used in electrical heating devices. Copper and aluminium are used for electrical transmission lines as they have low resistivity.

Resistors in Series

When two or more resistors are connected end to end, the arrangement is called series combination.

Total/resultant/overall/effective resistance in series

$$R_s = R_1 + R_2 + R_3 + \dots$$

Resistors in Parallel

Voltage across each resistor is same and equal to the applied voltage. Total current is equal to sum of currents through the individual resistances. Reciprocal of equivalent resistance is equal to sum of reciprocals of individual resistances. Equivalent resistance is less than the value of the smallest individual resistance in the combination.

$$1/R_p = 1/R_1 + 1/R_2 + 1/R_3 + \dots$$

Advantages of Parallel Combination over Series Combination

(i) In series circuit, when one component fails, the circuit is broken and none of the component works.

(ii) Different appliances have different requirement of

current. This cannot be satisfied in series as current remains same.

(iii) The total resistance in a parallel circuit is decreased.

Heating effect of electric current

If an electric circuit is purely resistive, the source of energy continually get dissipated entirely in form of heat. This is known as heating effect of electric current.

Joule's Law of Heating

It states that the heat produced in a resistor is (i) directly proportional to square of current, $H \propto I^2$. It is directly proportional to resistance for a given current, $H \propto R$. It is directly proportional to time for which current flows through the conductor, $H \propto t$. So, $H = I^2 Rt$. Heating effect is desirable in devices like electric heater, electric iron, electric bulb etc. Heating effect is undesirable in devices like computers, computer monitors (CRT), TV, refrigerators, etc. In electric bulb, most of the power consumed by the filament appears a heat and a small part of it is radiated in form of light.

• Filament of electric bulb is made up of tungsten because:

- (i) it does not oxidise readily at high temperature.
- (ii) it has high melting point (3380° C).

The bulbs are filled with chemically inactive gases like nitrogen and argon to prolong the life of filament.

• Electric Fuse: It is a safety device that protects our electrical appliances in case of short circuit or overloading. Fuse is made up of pure tin or alloy of copper and tin. Fuse is always connected in series with live wire. Fuse has low melting point. Current capacity of fuse is slightly higher than that of the appliance.

• Electric Power: The rate at which electric energy is consumed or dissipated in an electric circuit.

Important Formulae

$$I = \frac{Q}{t}, \quad V = IR, \quad I = \frac{V}{R}$$

$$V = \frac{W}{Q} \quad H = I^2 Rt, \quad H = VI t, \quad P = VI$$

$$E = Pt$$

$$H = E = W = VQ$$

$$R = \frac{\rho l}{A} \quad P = VI$$

No. of electrons = $\frac{\text{Amount charges (Q)}}{\text{Charge of one electron}}$

$$R_s = R_1 + R_2 + R_3 + \dots$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$$

$$\text{No. of resistors (n)} = \frac{R}{R_p}$$

$$n = \frac{\text{Resistance of one resistor}}{\text{Total resistance is parallel}}$$

SI units of

- (Charge) Q \longrightarrow coulomb (C)
- Current (I) \longrightarrow ampere (A)
- Potential Difference = Voltage \longrightarrow Volt (V)
- Resistance \longrightarrow ohm (Ω)
- Energy = Work done \longrightarrow joule (J)
- Resistivity \longrightarrow ohm metre (Ωm)
- Power (P) \longrightarrow watt (W)

Multiple choice question

1. **The SI unit of electric charge**
 a) ohm (Ω) b) Coulomb (C)
 c) Volt (V) d) Charge (Q)
 Answer : b) coulomb (c)
2. **Ameasures electric current in a circuit**
 a) Voltmeter b) Rheostat
 c) Ammeter d) Key
 Answer : c) Ammeter
3. **A current of 0.5 A is drawn by a filament of an electric bulb for 5 minutes. What is Q?**
 a) 300C b) 1500C
 c) 150C d) 3000C
 Answer : c) 150C
4. **Keeping the potential difference constant, the resistance of the circuit is halved. The current will become**
 a) one fourth b) four times
 c) half d) double
 Answer : d) double
5. **The potential difference measured by**
 a) Ammeter b) Voltmeter
 c) Rheostat d) None of these
 Answer : b) Voltmeter
6. **When electric current I flows through a resistance R for time 't' the electrical energy spent is given by**
 a) IRt b) I^2Rt
 c) IR^2t d) I^2R/t
 Answer : b) I^2Rt
7. **Electric current originate from which part of an atom**
 a) Nucleus b) Entire atom acting as unit c) Positively charged proton
 d) Negatively charged electrons
 Answer: d) Negatively charged electrons

- 8. The resistance of the wire varies inversely as**
 a) Area of cross section b) Resistivity
 c) Length d) Temperature
 Answer : a) Area of cross section
- 9. The ratio of voltage and electrical current in a closed circuit.**
 a) Decreases b) Increases
 c) Remains Constant d) Varies
 Answer : c) Remains Constant
- 10. The curve representing ohm's law is**
 a) Linear b) Cosine function
 c) Parabola d) Hyperbola
 Answer : a) Linear
- 11. Ohm's law states which relationship between electrical quantities.**
 a) Volts = I/A b) Volts = IxR
 c) Volts = C/Q d) V= R/Q
 Answer : b) Volts = IxR
- 12. The SI unit of power is**
 a) Joule b) Ampere
 c) watt d) ohm
 Answer: c) watt
- 13. The relation between potential difference (V) and Current (I) was discovered by**
 a) Volt b) ohm
 c) Newton d) Ampere
 Answer : b) ohm
- 14. What is the most commonly used conductor in electronics**
 a) Copper b) Aluminum
 c) Gold d) Silver
 Answer: a) Copper
- 15. If resistance decreases, then current will.**
 a) Increases b) Double
 c) Decreases d) Constant
 Answer: a) Increases
- 16. In series combination resistance increases due to increase in**
 a) Area of cross section b) Voltage
 c) Length d) Current
 Answer : c) Length
- 17. When 4Ω resistor is connected across the terminal of 2V battery, the number of Coulombs passing through the resistor per second is**
 a) 0.5 b) 1 c) 2 d) 4
 Answer: a) 0.5
- 18. Two appliances of rating 200 watt - 250 volts and 100 watt- 250 volts are joined in series to a 250 volts supply. Total power consumed in the circuit is**
 a) 46 watt b) 67 watt
 c) 10 watt d) 30 watt
 Answer : b) 67 watt
- 19. Which of the following laboratory apparatus is not used during the verification of ohm's law**
 a) Voltmeter b) Ammeter
 c) Galvanometer d) Rheostat
 Answer: c) Galvanometer
- 20. Electric pressure is also called**
 a) Resistance b) Power
 c) Voltage d) Energy
 Answer : c) Voltage
- 21. The resistance of a copper wire 200m long is 21Ω. If its thickness (diameter) is 0.44 mm, its specific resistance is around.**
 a) $1.2 \times 10^8 \Omega\text{m}$. b) $1.4 \times 10^8 \Omega\text{m}$.
 c) $1.9 \times 10^8 \Omega\text{m}$. d) $1.6 \times 10^8 \Omega\text{m}$.
 Answer: d) $1.6 \times 10^8 \Omega\text{m}$.
- 22. A current of 16 A divided between two branches in parallel of resistance 8 ohms and 12 ohms respectively. The current in each branch is**
 a) 6.4 A, 6.9 A b) 6.4 A, 9.6 A
 c) 4.6 A, 6.9 A d) 4.6 A, 9.6 A
 Answer : b) 6.4 A, 9.6 A
- 23. Which of the following material has a negative temperature coefficient of resistance.**
 a) Copper b) Aluminum
 c) Carbon d) Brass
 Answer : c) Carbon
- 24. The filament of an electric bulb is made up of**
 a) Carbon b) Aluminum
 c) Tungston d) Nickel
 Answer : c) Tungston
- 25. A closed switch has a resistance of**
 a) About 50 ohms b) About 500 ohms
 c) Infinity d) Zero
 Answer : d) Zero
- 26. An electric filament bulb can be worked from**
 a) DC supply only b) AC supply only
 c) Battery supply only d) All above
 Answer: d) All above
- 27. Two bulbs of 500 W and 200 W rated at 250 V will have resistance ratio as.**
 a) 2:5 b) 4:25
 c) 25:4 d) 5:2
 Answer : a) 2:5
- 28. Voltage dependent resistors are usually made from**
 a) Charcol b) Sillion Carbide
 c) Nichrome d) Graphite
 Answer : c) Nichrome
- 29. electric current passing through the circuit produces**
 a) Magnetic b) Luminous
 c) Thermal effect d) Chemical
 Answer : c) Thermal effect
- 30. The four bulbs of 40 W each are connected in series with a battery across them, which of the following statement is true?**
 a) The current through each bulb is same
 b) The voltage across each bulb is same
 c) The power dissipation in each bulb is not same
 d) None of the above
 Answer : a) The current through each bulb is same.

FILL IN THE BLANKS

- Bulbs in street lightings are all connected in**
Answer : Parallel
- Ohm's law is not applicable to**
Answer : Semiconductors
- materials has the least resistivity**
Answer : good conducting
- The SI unit of power is**
Answer : Watt
- Conductance is the reciprocal of**
Answer : Resistance
- An open resistor, when checked with an ohm meter reads**
Answer : Infinite
- All good conductors have high**
Answer : Conductance
- Nichrome wire is an alloy of**
Answer : Nickel and Chromium
- One newton meter is same as**
Answer : One Joule
- The relation between potential difference (V) current (I) is**
Answer : $V \propto I$
- The rate of flow of an electric charge is known as**
Answer : electric current
- The unit of emf is**
Answer : Volt
- The resistance of a conductor is directly proportion to**
Answer : Length
- If resistance decreases then current will**
Answer : Increase
- Electric potential is a**
Answer : Scalar quantity

NUMERICALS FOR PRACTICE

- A particle with charge of 1.5C is taken from a point at potential of 50V to another point at a potential of 120V. Calculate the work done.**
Answer : 105J
- How many electrons are required to get 1C of negative charge?**
Answer : 6.25×10^{18}
- How much current will flow through a resistor of resistance 12ohm if a battery of 18V is connected across it?**
Answer ; 1.5A
- Calculate the resistance of a copper wire of length 2m and area of cross –section 2sqmm.**
Answer : $5.1 \times 10^{-3}\Omega$

- When a potential difference of 20V is applied across a resistor, it draws a current of 3A. If 30V is applied across the same resistor, what will be the current.**

Answer : 4.5 A

- How will the resistance of a wire change if its diameter is doubled, if its length remaining the same?**

Answer : New resistance will became $\frac{1}{4}$ of initial resistance

- Three resistors of resistance 4Ω, 6Ω, 10Ω are connected in series with 5V cell. Calculate the potential difference across each resistor.**

Answer : $V_1 = 1V, V_2 = 1.5V, V_3 = 2.5V$

- A uniform wire of resistance R is cut into three equal pieces. These are jointed in parallel. What is the resistance of the combination?**

Answer : $R_p = R/9$

- Three resistors of 10Ω, 20Ω, 30Ω are connected in parallel with a 6V cell. Find a) the current through each resistor b) the current supplied by the cell c) the equivalent resistance of the circuit.**

Answer : $I_1 = 0.6A, I_2 = 0.3A, I_3 = 0.2A$

- How will you join three resistors of resistance 4Ω,6Ω, 12Ω to get an equivalent resistance of 8Ω? What would be the highest and lowest equivalent resistance possible by joining these resistors?**

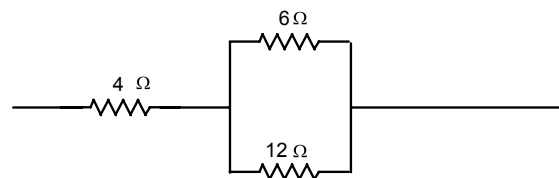
Highest resistance is obtained when they are in series. $R_s = 6 + 4 + 12 = 22\Omega$.

Lowest, when they are in parallel.

$$\frac{1}{R_p} = \frac{1}{6} + \frac{1}{4} + \frac{1}{12} = \frac{2+3+1}{12} = \frac{6}{12} = \frac{1}{2}$$

$R_p = 2\Omega$

To get 8Ω, 6 Ω and 12 Ω are connected in parallel and with this combination 4Ω is connected in series.



$R_1 = 4\Omega, R_2 = 6\Omega, R_3 = 12\Omega$

$$\frac{1}{R_p} = \frac{1}{6} + \frac{1}{12} = \frac{2+1}{12} = \frac{3}{12} = \frac{1}{4}$$

$R_p = 4\Omega$, total resistance = $4\Omega + 4\Omega = 8\Omega$

- How many bulbs of resistance 6 ohm should be joined in parallel to draw a current of 2A from a battery of 3V?**

Answer : $n = 4$

- A bulb is rated 40W, 220V. Find the current drawn by it is connected to a 220V supply.**

Answer : 0.18 A

13. A bulb is rated 60W, 240V, calculate its resistance when it is on. If the voltage drops to 192V, what will be the power consumed and the current drawn?

Answer : 38.4 W

14. An electric kettle is rated 500W, 220V. It is used to heat water for 30s. Assuming the voltage to be 220V, calculate the heat produced.

Answer : 15 kJ

15. The rate of electricity in a town is Rs.3 per unit. Calculate the cost of using a geyser of 1500W and a motor of 750W for 2 hour for 1 week.

Answer : Rs. 94.5

16. A 3V battery is connected to a bulb. The battery sends a current of 2.5A through it. Calculate a) the power delivered to the bulb and b) the energy transferred to the bulb in 5 minutes.

Answer : $P=7.5W$, $E=0.625Wh$

17. A 12V battery is connected to a bulb. The battery sends a current of 2.5A through it. Calculate a) the power delivered to the bulb and b) the energy transferred to the bulb 5 minutes.

Answer : $P=30W$, $E=2.5Wh$

19. Calculate the work done in taking a charge of 0.02C from A to B if the potential at A is 20V, and that at B is 30V.

Answer : 0.2J

20. How much charge flows through a wire in 10 minutes if the current through it is 2.5A?

Answer : 1500C

21. A 2V cell is connected to a 1ohm resistor. How many electrons will come out the negative terminal of the cell in 2 minutes?

Answer : 240 C

22. A 6V battery is connected across a 5ohm resistor. Calculate the current passing through the resistor.

Answer : 1.2 A

23. How will you join the resistors of 3ohm, 6 ohm and 8ohm to get an equivalent resistance of 10ohm?

Answer : Connect 3 Ω and 6 Ω in parallel and to this combination 8 Ω should be connected in series.

24. A 12V battery is connected to a bulb drives a current of 2A through it. Find the energy supplied by the battery in 20 minutes.

Answer : 28.8 kJ

26. A current of 1.5A flows through a wire of 8ohm. Find the amount of heat produced in 10s.

Answer : 180J

27. Two resistors 10 ohm and 20 ohm are joined in series. A potential difference of 12V is applied across the combination. Find the power consumed by the resistor.

Answer : 4.8 W

28. Calculate the energy consumed in kilowatt hours by a 60W fan in 2 hours.

Answer : 0.12kWh

29. An electric iron has a rating of 750W, 220V.C calculate a) current passing through it and b) its resistance when in use

Answer : $I=3.4A$, $R=64.5\Omega$

30. An electric lamp is marked 100 W, 220V. It is used for 5 hours a daily calculate it's a) resistance while glowing and b) energy consumed in kWh per day?

Answer = $R=484\Omega$, $E=0.5kWh$

32. How many electrons are there in 10C of charge?

Answer : 6.25×10^{19}

33. An electric bulb draws a current of 0.2A when the voltage is 220V. Calculate the amount of electric charge following through it in one hour.

Answer : 720 C

34. You are given a 8 ohm resistor. What will be resistance that you put in parallel to make a resistance of 2 ohm?

Answer : 2.66 Ω or $\frac{8}{3}\Omega$

35. Two bulb or whose resistances are in the ratio 1:2, are connected in parallel to a source of constant voltage. What will be the ratio of power dissipation of these?

Answer : $P_1 : P_2 = 2 : 1$

36. If a wire of resistivity (ρ) is stretched to thrice its initial length, what will be its new resistivity?

Answer : The resistivity will remain the same because resistivity does not depend on length, it depends only on temperature.

37. Which has greater resistance 1kw electric heater or a 100 W filament bulb both marked for 220V?

Answer: Filament has more resistance

38. Nichrome and copper wires of same length and same radius are connected in series current I is passed through them. Why does Nichrome wire heated up first?

Answer: Nichrome wire gets heated up first because it is an alloy that has higher resistivity produces more heat while copper has low resistivity and allows current to easily pass through it.

39. A wire of uniform area of cross section is stretched to four times its original length by what factor does its resistivity change?

Answer: Its resistivity remains the same because it does not depend on length or area of cross section. It depends only on temperature. It increases when temperature increases.

40. Which has higher resistance: a 50W lamp bulb or a 245W lamp bulb? If potential difference provided to both is the same.

Answer = 50 W lamp bulb has more resistance.

41. In a household 5 tube light of 40W each are used for 5 hours and an electric press of 500W for 4 hours everyday. Calculate the total electrical energy consumed by both the gadgets in a month of 30 days.

Answer : 90kWh

42. Two identical resistors 2 ohm each are connected

in 1) series and 2) parallel to battery of 12V. Find the ratio of power consumed in two cases.

Answer : 1:2

43. Relate kWh with joule.

$$\begin{aligned} 1\text{kWh} &= 1000\text{W} \times 3600\text{s} \\ &= 3.6 \times 10^6\text{Ws} \\ 1\text{kWh} &= 3.6 \times 10^6\text{J} \end{aligned}$$

44. What is the usual capacity of the fuse wire in line to feed a) light and fans b) appliances of 2k W or more power?

- a. 5A b. 15A

QUESTIONS AND ANSWERS

1. Define electricity or electric current?

Answer: The rate of flow of electric charges is called electric current.

2. What does and electric circuit mean?

Answer: A closed and continuous path of electric current is called electric circuit.

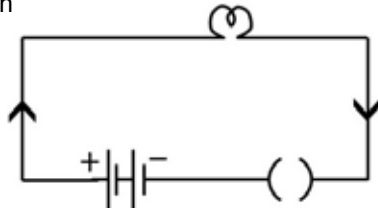
3. What is a switch?

Answer: A switch acts as a conducting link between the source of electricity and the device (bulb).

4. Differentiate between open and closed circuit with figure.

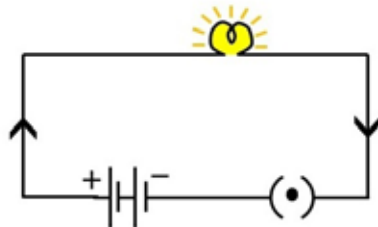
Answer: **Open circuit**

Current does not flow
Switch is open



Closed circuit

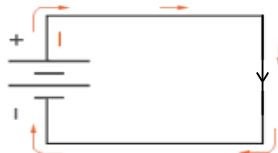
Current flows
Switch is closed



5. Differentiate between conventional current and electron flow.

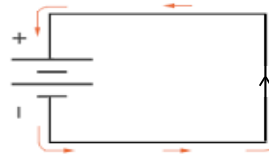
Answer: Conventional current

- Positive charges flow through circuit.
- Charges flow from the positive terminal to negative terminal



Answer: Electron flow

- Negative charges flow through circuit
- Charges flow from negative terminal to positive terminal



6. Give the relation between electric current, charges and time.

Answer: Electric current is the rate of flow of charges.

$$\text{Electric current (I)} = \frac{\text{Amount of Charges (Q)}}{\text{Time (t)}}$$

7. A current of 0.2A is drawn by an electric bulb for 5 mins. Find the amount of charge that flows through the circuit.

Answer:

$$\begin{aligned} I &= 0.2\text{A}, t = 5 \text{ mins} = 300 \text{ s} & 0.2\text{A} &= \frac{Q}{300\text{s}} \\ I &= \frac{Q}{t} & Q &= 0.2 \times 300 = 60\text{C} \end{aligned}$$

8. 200 C of charge is flowing in a circuit for 2 mins. Find the amount of current flowing through it.

Answer:

$$\begin{aligned} Q &= 200 \text{ C}, t = 2 \text{ mins} = 120\text{s} & I &= \frac{200}{120} = \frac{5}{3} \\ I &= \frac{Q}{t} & &= 1.666\text{A} \end{aligned}$$

9. What is the charge of electron? Calculate the number of electron constituting one coulomb of charge.

Answer:

The charge of an electron = $1.6 \times 10^{19}\text{C}$.

$$\text{No of electrons} = \frac{1\text{C}}{1.6 \times 10^{19}\text{C}}$$

$$n = \frac{1 \times 10^{19}}{1.6} = \frac{10}{16} \times 10^{19}$$

$$n = 0.625 \times 10^{19} = 6.25 \times 10^{18}$$

10. How many electrons are there in 2C of charge?

Answer:

$$\begin{aligned} n &= \frac{Q}{e} \\ n &= \frac{2\text{C}}{1.6 \times 10^{19}} = \frac{20 \times 10^{19}}{16} \\ n &= 1.25 \times 10^{19} \\ &= 12.5 \times 10^{18} \end{aligned}$$

11. Define SI unit of current.

Answer: 1 ampere is defined as IC of charge flowing through an area in 1 second of time.

12. What is an ammeter and how is it connected in an electric circuit?

Answer: An ammeter is a device that measures electric current in a circuit and is connected in series because it has low resistance.

13. Define potential difference

Answer: Potential difference between any two points in a circuit carrying some current is defined as the work done to move a unit charge from one place to the other.

14. Define electric potential at a point?

Answer: Electric potential at a point is defined as the work done in bringing a charge from infinity to that point.

15. What is a voltmeter? How is it connected in a circuit?

Answer: Voltmeter is a device which measures potential difference in a circuit. It is connected in parallel because of its high resistance.

16. Name a device that helps to maintain potential difference across a conductor?

Answer: Battery or cell

17. What makes an electron to move in conductor?

Answer: Potential difference makes electron move in a conductor.

18. Give the relationship between p.d., work done and charge.

Answer:

$$V = \frac{W}{Q}$$

19. Define SI unit of potential difference.

Answer: 1 volt is defined as the potential difference between two points in a current carrying conductor when 1J of work is done to move 1C of charge from one point to other.

20. What is meant by saying that the potential difference between two points is 1V?

Answer: Potential difference between two point is 1V means that 1J of work has to be done to bring 1C of charge from one point to the other.

21. How much energy is given to each coulomb of charge passing through a 6V battery?

Answer:

$$\begin{aligned} (V) &= 6V \\ Q &= 1C \\ E = W &= VQ \\ &= 6 \times 1 = 6J \end{aligned}$$

22. Name the physical quantities represented by the following?

Answer:

- Electric current
- Potential difference

23. How much work is done in moving a charge of 3C across two points having a potential difference of 6V?

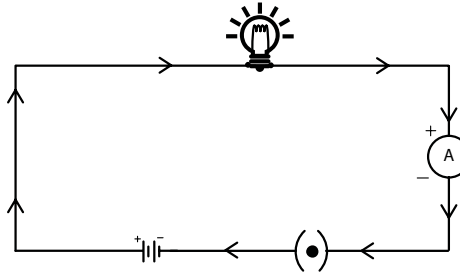
Answer:

$$\begin{aligned} V &= 6V \\ Q &= 3C \\ W &= VQ \\ &= 6 \times 3 = 18J \end{aligned}$$

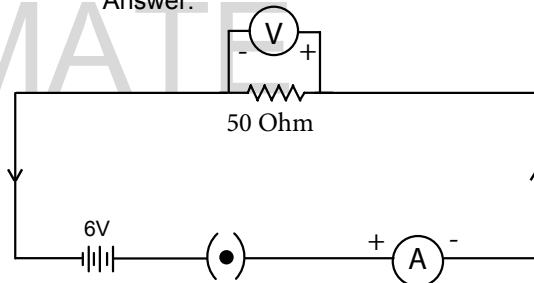
24. How much work is done in moving a charge of 4C across two points having a potential difference of 6V?

Answer:

$$\begin{aligned} Q &= 4C \\ V &= 6V \\ W &= VQ \\ &= 6 \times 4 = 24J \end{aligned}$$

25. Draw a circuit which consist of battery of 2 cells key, bulb and an ammeter.**26. Draw a schematic diagram of a circuit consisting of a battery of three cells of 2V each. A 50hm resistor, an ammeter and a voltmeter across a resistor and a switch.**

Answer:

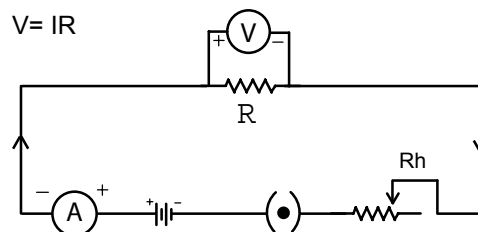
**27. State ohm's law and give its mathematical expression.**

Answer: Ohm's law states that the potential difference between the ends of a conductor in a current carrying circuit is directly proportional to the electric current flowing through it provided its temperature remains the same.

$$V = IR$$

28. Draw the circuit diagram to verify Ohm's law

Answer:

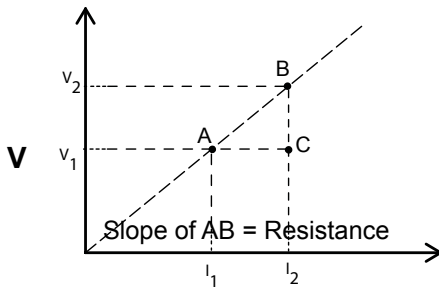
**29. What do the following represent**

Answer:

- slope of V-I graph — resistance (R)
- slope of I-V graph — reciprocal of resistance (1/R)

30. Draw V.I graph and show how to calculate resistance.

Answer:



$$R = \frac{BC}{AC} = \frac{V_2 - V_1}{I_2 - I_1}$$

31. Define SI unit of resistance (ohm)

Answer: 1 ohm is defined as the resistance of a conductor, whose potential difference across its ends is 1 V and the current following through it is 1A.

32. What is a rheostat?

Answer: It is a device which is used to change the resistance in a circuit without changing the voltage source.

33. What are the factors on which resistance of a conductor depends?

Answer: 1. Length of the conductor (L)

2. Area of cross section (A)

3. Nature of the material of the conductor

4. Temperature (T)

34. Give the SI unit of resistivity.

Answer: Ohm metre (Ωm)

35. The resistivity of copper wire of 5 Ω resistance is $1/62 \times 10^{-8} \Omega\text{-m}$.

(a) What is the resistivity of it if its resistance is increased to 10 Ω , at same temperature?

(b) If temperature of the wire increases what will happen to its resistivity?

Answer: a) Resistivity will not change because of the same temperature. It remains the same

b) When temperature increases resistivity will increase.

36. Define resistivity?

Answer: The resistance of a conductor of unit length and unit area of cross section is called resistivity.

37. Two materials of resistivity $5.2 \times 10^{-8} \Omega\text{m}$ and $10^{12} \Omega\text{m}$. identify the type of material as conductor and insulator.

Answer: Here, conductor is of resistivity of $5.2 \times 10^{-8} \Omega\text{m}$

Insulator is of resistivity of $10^{12} \Omega\text{m}$.

38. Will current flow more easily through a thick wire or a thin wire of the same material, when connected to the same source? Why?

Answer: Current flow more easily through a thick wire. Because

$$I \propto \frac{1}{R} \text{ and } R \propto \frac{1}{A}$$

When area of cross section is more it has less resistance and more current will flow in the thick wire.

39. Let the resistance of an electrical component remains constant while the potential difference across the two ends of the component decreases to half of its former value. What change will occur in the current through it?

Answer: By ohm's law, $V \propto I$ so when potential difference became half and resistance remains the same current will also become half of the original value.

By ohm's law, $I = \frac{V}{R}$

$$R = R$$

$$V_{\text{new}} = \frac{V}{2}$$

$$I = ?$$

$$I_{\text{new}} = \frac{V_{\text{new}}}{R} = \frac{V/2}{R} = \frac{1}{2} \frac{V}{R} = \frac{1}{2} \times I$$

40. How much current will an electric bulb draw from a 220V source, if the resistance of the bulb is 1200 Ω ?

Answer: $V = 220\text{V}$

$$R = 1200 \Omega$$

$$I = \frac{V}{R} = \frac{220}{1200}$$

$$= 0.183 \text{ A}$$

41. The potential difference between the terminals of an electric heater is 60V when it draws a current of 4A from the source. What current will the heater draw if the p.d is increases to 120V?

Answer : Case I, $V_1 = 60 \text{ V}$

$$I_1 = 4 \text{ A}$$

Resistance of heater,

$$R = \frac{V}{I_1} = \frac{60}{4} = 15 \Omega$$

Case II, $V_2 = 120\text{V}$

$$R = 15 \Omega$$

$$I_2 = \frac{V_2}{R} = \frac{120}{15} = 8 \text{ A}$$

42. Calculate the resistivity of the material of a wire 1m long, 0.4mm in diameter and having a resistance of 2 Ω .

Answer:

$$l = 1 \text{ m}, d = 0.4 \text{ mm}, R = 2 \Omega, \rho = ?$$

$$\rho = \frac{RA}{l}$$

$$A = \pi r^2$$

$$d = 0.4\text{mm} = 0.4 \times 10^{-3}\text{m}$$

$$r = 0.2 \times 10^{-3}\text{m}$$

$$A = 3.14 \times 0.2 \times 0.2 \times 10^{-6}$$

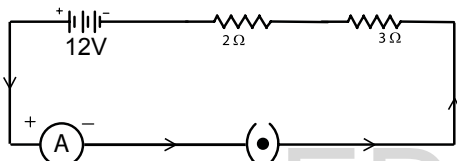
$$\rho = \frac{2 \times 3.14 \times 0.2 \times 0.2 \times 10^{-6}}{1\text{m}} = 2.512 \times 10^{-5} \Omega\text{m}$$

43. Why are the coils of electric toasters and electric irons made of an alloy rather than a pure metal?

Answer: The coils of electric toasters and electric irons are made of alloy because alloys have higher resistivity than their constituents and they do not get oxidized at high temperature.

44. Draw a circuit diagram where a battery of 12V, 2Ω resistor, a 3Ω resistor and a switch all connected in series. Calculate the amount of current flowing through the circuit.

Answer:



$$R_1 = 2\Omega, R_2 = 3\Omega$$

$$R_2 = 5\Omega, p.d = 12V$$

$$I = \frac{V}{R} = \frac{12}{5} = 2.4A$$

45. Judge the equivalent resistance when the following are connected in parallel 1Ω and 106Ω.

Answer: Since they are in parallel the total resistance will be less than the smallest resistance i.e, 1Ω ,

$$R_p < 1\Omega$$

47. What is a) the highest b) the lowest total resistance that can be secured by combinations of four coils of resistance 4Ω, 8Ω, 12Ω, 24Ω?

Answer: To get maximum resistance resistors should be connected in series.

$$R_s = R_1 + R_2 + R_3 + R_4 = 4 + 8 + 12 + 24 = 48\Omega.$$

To get the least resistance, connect the resistors in parallel.

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} = \frac{1}{4} + \frac{1}{8} + \frac{1}{12} + \frac{1}{24}$$

$$= \frac{6 + 3 + 2 + 1}{24} = \frac{12}{24} = \frac{1}{2}$$

$$\text{Lowest resistance} = R_p = 2\Omega$$

48. A wire of resistance 5m is bent in the form a circle to form a closed circuit. What is the resistance between two points at the end of a diameter?

Answer: The two halves of the wire are connected in parallel. Each part has a resistance of .

$$\frac{5}{2} \Omega$$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{2.5} + \frac{1}{2.5} = \frac{20}{25} = \frac{4}{5}$$

$$R_p = \frac{5}{4}$$

$$R_p = 1.25\Omega.$$

46. How can three resistors of resistances 2Ω, 3Ω and 6Ω be connected to obtain a total resistance of a) 4Ω, b) 1Ω?

Answer:

$$R_1 = 2\Omega, R_2 = 3\Omega, R_3 = 6\Omega$$

To get 4Ω	To get 1Ω
$\frac{1}{R_p} = \frac{1}{3} + \frac{1}{6} = \frac{2+1}{6} = \frac{3}{6} = \frac{1}{2} \Rightarrow R_p = 2\Omega$ $R_1 + R_p = 2 + 2 = 4\Omega$	$\frac{1}{R_p} = \frac{1}{2} + \frac{1}{3} + \frac{1}{6} = \frac{3+2+1}{6} = \frac{6}{6} = 1$ $R_p = 1\Omega$

49. Compare the series and parallel connection of devices with a battery.

Answer:

Series	Parallel
1. Same amount of current flows through each device.	1. Different amount current is provided to different devices according to their need.
2. Potential difference across each device is different.	2. Potential difference across each device is the same
3. Only 1 switch is provided for all the devices.	3. Different switches can be provided for different instrument.
4. Total resistance is more than the component resistors.	4. Total resistance will be less than the component resistors.
5. If one device stops working others will also stop.	5. If one device stops working others will continue working.

50. Why is series arrangement not used for domestic circuits?

Answer:

- * Different devices need different amount of current but series circuit provide same amount of current to all.
- * If one device stops working others may not work.
- * Different devices get different amount of p.d.
- * Total resistance in the circuit will be more.

51. What do you mean by heating effect of electric current?

Answer: When electric current flows through a resistor heat is produced in it. This effect is called heating effect of electric current.

52. State Joules law of heating?

Answer: Joules law of heating states that heat produced in resistor is 1) directly proportional to the square of current for a given resistance, ii) directly proportional to resistance for a current and iii) directly proportional to the time for which the current flows through the resistor.

53. An electric iron of resistance 20Ω takes a current of 5A. Calculate the heat developed in 30s.

Answer:

$$\begin{aligned}
 t &= 30\text{s}, I = 5\text{A} \\
 R &= 20\Omega, \\
 H &= I^2Rt \\
 &= 5^2 \times 20 \times 30 = 25 \times 20 \times 30 = 25 \times 600 \\
 &= 15000 \text{ J} = 15\text{kJ}
 \end{aligned}$$

54. Find the heat generated while transferring 96000C of charge in one hour through a p.d of 50V.

 Answer: $Q = 96000\text{C}, V = 50\text{V}, t = 1\text{hr}$
 $\text{Heat} = \text{Work done}$

$$H = VQ$$

$$= 50 \times 96000 = 4800000\text{J}$$

$$= 4.8 \times 10^6\text{J} \text{ or } = 4800\text{kJ}$$

55. What is a fuse & how is it connected in a circuit? Name some metals used to make fuse wire?

Answer: Fuse is a safety device used in an electrical circuit which is made of a metal or an alloy of appropriate melting point. It is always connected in series in an electric circuit. Copper, aluminum, iron and lead are some metals used to make fuse wire.

56. How does a fuse work?

Answer: If a current larger than the specified value flows through the circuit, the temperature of the fuse wire increases. This melts the fuse wire and breaks the circuit. Thus protect the circuit.

57. An electric iron is rated 220v-1000W. What is the resistance of its element? What is the maximum value of the current which can pass through it? Find the rating of the fuse to be used.

Answer:

$$P = 1000 \text{ W}, V = 220, R = ?, I = ?$$

$$P = VI$$

$$I = \frac{P}{V} = \frac{1000}{220} = 4.54\text{A}$$

We have to use the fuse 5A

58. Define S.I unit of electric power.

Answer: One watt is defined as the power consumed by a device that carries 1 A of current when operated at a potential difference of 1V.

59. Define one watt hour.

Answer: One watt hour is defined as the energy consumed when 1 watt of power is used for one hour.

60. Name the commercial unit of energy.

Answer: Commercial unit of energy is kilo watt hour (kWh).

61. Convert commercial unit of energy into S.I unit.

Answer:

Commercial unit of energy = kWh

S. I unit = joule

$$1 \text{ kWh} = 1000 \text{ Wh}$$

$$= 1000 \times 3600 \text{ s} \times \text{J/s} = 3.6 \times 10^6 \text{ J}$$

62. An electric bulb is connected to a 220V source. The current drawn is 0.75A. Find the power of the bulb.

Answer:

$$V = 220\text{V}, I = 0.75\text{A}, P = ?$$

$$P = VI$$

$$= 220 \times 0.75 = 165\text{ W}$$

- 63. An electric heater rated 500 W and a bulb rated 60W are used for 5 hours/day. Calculate the total energy consumed by the in the month of September in kWh. Find the cost of energy consumed at rate of Rs. 5 per unit.**

Answer:

$$P_1 = 500\text{ W}, P_2 = 60\text{ W}$$

$$t = 5 \times 30 = 150\text{ h}$$

$$\text{Energy used by heater } E_1 = P_1 t$$

$$= 500 \times 150 = 75000\text{Wh}$$

$$= 75\text{ kWh}$$

$$\text{Energy used by bulb, } E_2 = P_2 t$$

$$= 60 \times 150 = 9000\text{Wh} = 9\text{ kWh}$$

$$E = E_1 + E_2 = 84\text{kWh} = 84\text{ unit}$$

$$\text{Cost per unit} = 5$$

$$\text{Total cost} = \text{No. of units} \times ₹ 5 = 84 \times 5 = ₹ 420$$

- 64. An electric motor takes 5A current from a 220V source. Find the power of the motor and energy consumed for 2h.**

Answer:

$$I = 5\text{A}, V = 220\text{ V}, t = 2\text{h}$$

$$P = VI = 5 \times 220 = 1100\text{W}$$

$$E = Pt = 1100 \times 2 = 2200\text{Wh} = 22\text{kWh}$$

$$= 2.2\text{ units}$$

- 65. Why do we connect an ammeter in series and a voltmeter in parallel?**

Answer: An ammeter is connected in series because it has low resistance and a voltmeter is connected in parallel because it has high resistance.

- 66. An electric bulb is rate 220V and 100W. When is operated on 110V, what will be its power?**

Answer:

$$P_1 = 100\text{W}, V_1 = 220\text{V}, R = ?$$

$$P = \frac{V^2}{R}$$

$$R = \frac{V^2}{P_1} = \frac{220 \times 220}{100}$$

$$= 484\Omega$$

$$V_2 = 110\text{V}, R = 484\Omega$$

$$P = \frac{V^2}{R}$$

$$= \frac{110 \times 110}{484} = \frac{100}{4}$$

$$= 25\text{W}$$

- 67. Why is tungsten used exclusively for filament of electric lamps?**

Answer: Tungsten is used exclusively for filament of electric lamps because of its high resistivity and high melting point. (3380°C)

- 68. How does resistance of a wire vary with its area of cross-section?**

Answer: Resistance is inversely proportional to area of cross section ($R \propto 1/A$). So resistance increases when area of cross decreases and vice versa.

- 69. Why are copper and aluminium wires usually used for electric transmission?**

Answer: Copper and aluminium wires usually used for electric transmission because they are very good conductors of electricity due to low resistance.

- 70. Which used more energy, a 250W TV set in 1h or a 1200W toaster in 10 minutes?**

Answer:

$$P_1 = 250\text{ W}, t_1 = 1\text{h}$$

$$E_1 = P_1 t_1 = 250 \times 1$$

$$= 250\text{ Wh}$$

$$P_2 = 1200\text{W}, t_2 = 10\text{ min} = \frac{1}{6}\text{h}$$

$$E_2 = P_2 \times t_2$$

$$= 1200 \times \frac{1}{6} = 200\text{ Wh}$$

So TV uses more energy.

- 71. An electric heater of resistance 8Ω draws 15A from a service mains for 2h. Find the rate at which heat is developed in the heater.**

Answer:

$$R = 8\Omega, I = 15\text{A}, t = 2\text{h}$$

Rate at which energy consumed is power.

$$\frac{E}{t} = P = I^2 R$$

$$= 15 \times 15 \times 8 = 1800\text{W}$$

- 72. A battery of 9V connected in series with resistors of 0.2Ω , 0.3Ω , 0.4Ω , 0.5Ω and 12Ω respectively. How much current will flow through the 12Ω resistor?**

Answer: Since the resistors are in series, same current will flow through each resistors.

$$V = 9\text{ V}$$

$$R_s = R_1 + R_2 + R_3 + R_4 + R_5$$

$$= 0.2 + 0.3 + 0.4 + 0.5 + 12 = 13.4\Omega$$

$$I = \frac{V}{R} = \frac{9}{13.4} = \frac{90}{134} = 0.67 A$$

73. How many 176 Ω, resistors in parallel are required to carry 5A and on 220V line? (NCERT),

$$I = 5A, V = 220V \quad N = ?, R_p = ?$$

Answer:

$$R_p = \frac{V}{I} = \frac{220}{5} = 44 \Omega$$

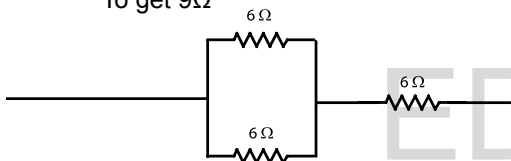
$$\text{Number of resistors} = \frac{R}{R_p}$$

$$= \frac{176}{44} = 4$$

74. Show how would you connect three resistors, each of resistance 6ohm, so that the combination has resistance of i) 9Ω, ii) 4Ω

$$R_1 = 6\Omega, R_2 = 6\Omega, R_3 = 6\Omega$$

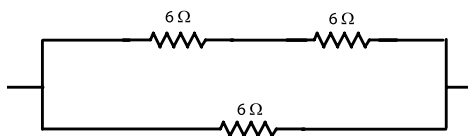
To get 9Ω



$$R_p = \frac{R_1 R_2}{R_1 + R_2} = \frac{6 \times 6}{6 + 6} = \frac{36}{12} = 3\Omega$$

$$R_s = R_p + R_3 = 3 + 6 = 9\Omega$$

To get 4Ω



$$R_s = 6 + 6 = 12\Omega$$

$$\frac{1}{R_{total}} = \frac{1}{12} + \frac{1}{6}$$

$$R_{total} = \frac{R_1 R_2}{R_1 + R_2} = \frac{12 \times 6}{12 + 6} = 4\Omega$$

75. Several electric bulbs designed to be used on a 220V electric supply line, are rated 10W. How many lamps can be connected in parallel with each other across the two wires 220V line of the maximum allowable current is 5A?

Answer:

$$\text{Power of 1 bulb} = 10W$$

$$V = 220 V$$

$$\begin{aligned} \text{Resistance of 1 bulb} &= \frac{V^2}{P} \\ &= \frac{220 \times 220}{10} = 4840 \Omega \end{aligned}$$

$$\text{Max current in circuit} = 5A$$

$$\text{Total resistance} = \frac{V}{I} = \frac{220}{5} = 44\Omega$$

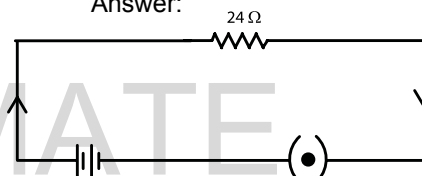
Let n be the no of bulbs

$$\begin{aligned} n &= \frac{R}{R_p} = \frac{4840}{44} \\ &= 110 \end{aligned}$$

76. A hot plate of an electric oven connect to a 220V line has to resistance coils A and B, each of 24Ω, resistance, which may be used separately in series, or in parallel, What are the current in the three cases?

Case 1

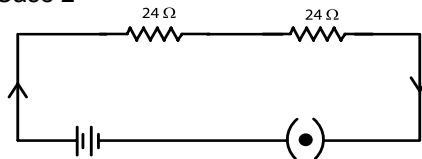
Answer:



$$V = 220V, R_1 = 24\Omega$$

$$\begin{aligned} I_1 &= \frac{V}{R_2} \\ &= \frac{220}{24} = 9.16A \end{aligned}$$

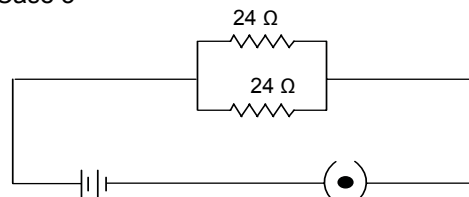
Case 2



$$R_s = 24 + 24 = 48\Omega$$

$$\begin{aligned} I_2 &= \frac{V}{R_s} = \frac{220}{48} \\ &= 4.58A \end{aligned}$$

Case 3



$$\begin{aligned} R_p &= \frac{R_1 R_2}{R_1 + R_2} = \frac{24 \times 24}{48} \\ &= \frac{24 \times 24}{48} = 12\Omega \end{aligned}$$

$$I_3 = \frac{V}{R_p} = \frac{220}{12} = 18.33A$$

77. A copper wire has diameter 0.5mm and resistivity of $1.6 \times 10^{-8}\Omega$. What will be the length of the wire to make its resistance 10Ω ?

$$\begin{aligned} d &= 0.5 \text{ mm} \\ r &= 0.25 \times 10^{-3} \text{ m} \\ \rho &= 1.6 \times 10^{-8} \Omega\text{m} \\ R &= 10 \Omega \\ l &= ? \end{aligned}$$

Answer:

$$\begin{aligned} R &= \frac{\rho \ell}{A}, \quad \ell = \frac{RA}{\rho} \\ l &= \frac{10 \times \rho \pi r^2}{1.6 \times 10^{-8}} \\ &= \frac{10 \times 3.14 \times 0.25 \times 0.25 \times 10^{-6}}{1.6 \times 10^{-8}} \\ &= 1.226 \times 10^2 \text{ m} \\ &= 122.72 \text{ m} \end{aligned}$$

78. Two lamps, one rated 100W at 220V, the other 60W at 220V are connected in parallel to electric mains supply. What current is drawn from the line if the supply voltage is 220V?

Answer:

$$\begin{aligned} V_1 &= 220V \\ P_1 &= 100W \\ P_1 &= VI_1 \\ I_1 &= \frac{P_1}{V} = \frac{100}{220} \\ &= \frac{5}{11} A \\ V_2 &= 220V \\ P_2 &= 60W \\ I_2 &= \frac{P_2}{V} \\ I_2 &= \frac{60}{220} = \frac{3}{11} \\ \text{Total current} \\ I &= I_1 + I_2 \\ &= \frac{5}{11} + \frac{3}{11} = \frac{8}{11} = 0.724A \end{aligned}$$

79. What will happen to the amount of current flowing in a circuit, if two resistors connected in series are changed to parallel?

Answer: Since the total resistance in parallel is less than

that in series, the amount of current will increase.

$$\text{Because } I \propto \frac{1}{R}$$

80. An electric bulb is rated 100W-220V. What do you understand by this statement?

Answer: This statement means that the rate at which energy consumed is 100W when the p.d is 220V.

81. Why does the cord of an electric heater not glow while the heating element does?

Answer: Cord of an electric heater is made up of thick copper wire which has much lower resistance that is heating element. For the same current flowing through the cord and the element, heat produced in the element is much more than that of a cord ($H = I^2Rt$). So, the element becomes very hot and it glows, whereas chord does not become hot and it does not glow.

82. Differentiate between the unit 'watt' (W) and watt-hour (Wh)?

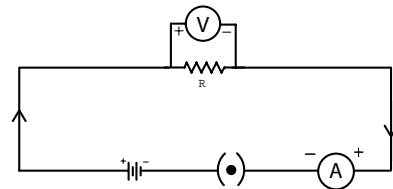
Answer: Watt represents the S.I units of power and watt hour represents the SI unit of energy.

83. Derive Joules law of heating .

Answer: Consider a resistor of resistance R through which a current of I is flowing and p.d across is V. If Q amount of charge is flowing for t seconds then the work done for it is given by $W = VQ$.

Then the power input to the circuit by the source is

$$\begin{aligned} P &= \frac{W}{t} = \frac{VQ}{t} = V \cdot \frac{Q}{t} = V \cdot \frac{It}{t} = VI \\ \text{So the energy supplied in the circuit in time } t \text{ seconds } E &= Pt = Vit \\ &= IRIt \text{ [} V = IR \text{]} \\ E &= I^2Rt \end{aligned}$$

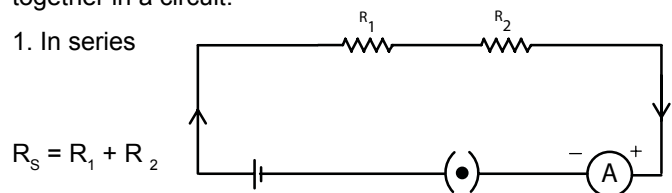


This energy is dissipated in the form of heat. Therefore, $H = I^2Rt$. This is Joules law of heating.

COMBINATION OF RESISTORS

There are two methods of joining two or more resistors together in a circuit.

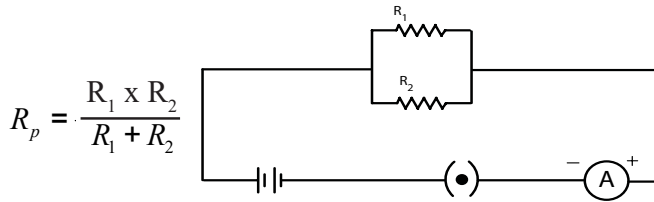
1. In series



$$R_s = R_1 + R_2$$

*When resistors are connected in series the total resistance will be more than the highest resistance.

2. In parallel



*When resistors are connected in parallel the total resistance will be less than each individual resistance.

84. Two resistors of 6Ω and 3Ω are connected in parallel in a circuit. Find the effective resistors.

$$R_1 = 6\Omega, R_2 = 3\Omega$$

$$R_p = ?$$

$$\text{Answer: } \frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{6} + \frac{1}{3}$$

$$\frac{1}{R_p} = \frac{1+2}{6} = \frac{3}{6} = \frac{1}{2}$$

$$R_p = 2\Omega$$

85. Two resistors of 8Ω and 2Ω are connected in parallel in a circuit. Find the total resistance.

$$R_1 = 8\Omega, R_2 = 2\Omega$$

$$R_p = ?$$

Answer:

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{8} + \frac{1}{2}$$

$$= \frac{1+4}{8} = \frac{5}{8}$$

$$\frac{1}{R_p} = \frac{5}{8}$$

$$R_p = \frac{8}{5} = 1.6\Omega$$

$$R_p = \frac{8}{5} = 1.6\Omega$$

NCERT SOLUTIONS (ELECTRICITY)

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Q.5. Use the data in table 12.2 to answer the following

- Which among iron and mercury is a better conductor?
- Which material is the best conductor?

Answer :

a) Resistivity of Iron = $10.0 \times 10^{-8} \Omega\text{m}$

Resistivity of mercury = $94.0 \times 10^{-8} \Omega\text{m}$

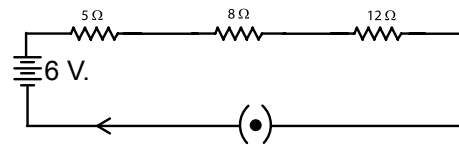
Resistivity of mercury is more than that of iron. This implies that iron is a better conductor than mercury.

- It can be observed from Table 12.2 that the resistivity of silver is the lowest among the listed material. Hence it is the best conductor.

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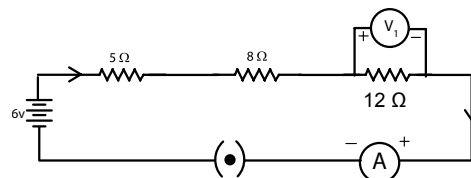
1. Draw a schematic diagram of a circuit consisting of a battery of three cells of 2 V each a 5Ω resistor and 8Ω resistor and 12Ω resistor and plug key all connected in series.

ANSWER : Three cells of potential 2 V, each connected in series therefore the potential difference of the battery will be $2\text{ V} + 2\text{ V} + 2\text{ V} = 6\text{ V}$. The following circuit diagram shows three resistors of resistance 5 Ω, 8 Ω and 12 Ω respectively connected in series and a battery of potential 6 V and plug key which is closed means the current is flowing in the circuit.



2. Redraw the circuit question no. 1 putting in an ammeter measure the circuit through the resistors and a voltmeter to measure the potential difference across the 12Ω resistor. What would be the reading in the ammeter and voltmeter?

An ammeter should be connected in the circuit in series with the resistors. To measure the potential across the resistor. It should be connected in parallel as shown in following figure.



The resistors are connected in series. Ohm's law can be used to obtain the readings of ammeter and voltmeter according to Ohm's law

$$V = IR$$

Where, potential difference $V = 6\text{V}$

Current flowing through the circuit = I

Resistance of the circuit $R = 5 + 8 + 12 = 25\Omega$

$$I = \frac{V}{R} = \frac{6}{25} = 0.24\text{A}$$

Potential difference (PD) across 12 Ω resistor = V_1

Current flowing through the 12 Ω resistor

$$I = 0.24\text{ A.}$$

Therefore using Ohm's law, we obtain

$$V_1 = IR = 0.24 \times 12 = 2.88\text{ V}$$

∴ The reading of ammeter will be = 0.24 A

The reading of voltmeter will be = 2.88 V

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1. Judge the equivalent resistance when the following are connected in parallel a) 1Ω and $10^6\Omega$ b) 1Ω and $10^3\Omega$ and $10^6\Omega$.

Answer :

a) When 1Ω and $10^6\Omega$ are connected in parallel

Let R be the equivalent resistance

$$\therefore \frac{1}{R} = \frac{1}{1} + \frac{1}{10^6}$$

$$\frac{1}{R} = \frac{1+10^6}{10^6}$$

$$R = \frac{10^6}{1+10^6} = \frac{10^6}{10^6} = 1\Omega$$

Therefore equivalent resistance = 1Ω

b) When 1Ω , $10^3\Omega$ and $10^6\Omega$ are connected in parallel

Let R be the equivalent resistance

$$\frac{1}{R} = \frac{1}{1} + \frac{1}{10^3} + \frac{1}{10^6}$$

$$\frac{1}{R} = \frac{10^6 + 10^3 + 1}{10^6}$$

$$R = \frac{10^6}{10^6 + 10^3 + 1}$$

$$R = \frac{1000000}{1001001} = 0.999\Omega$$

Therefore equivalent resistance = 0.999Ω

2. An electric lamp of 100Ω a toaster of resistance 50Ω and water filter of resistance 500Ω are connected in parallel to a $220V$ source. What is the resistance of an electric iron connected to the same source that take as much current as all three appliances and what is the current through it?

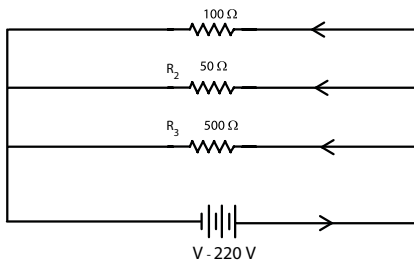
Answer : Resistance of electric lamp $R_1 = 100\Omega$

Resistance of toaster $R_2 = 50\Omega$

Resistance of water filter $R_3 = 500\Omega$

Potential difference of the source $V = 220V$

These are connected in parallel as shown in following figure



Let R be the equivalent resistance of the circuit

$$\frac{1}{R} = \frac{1}{R^1} + \frac{1}{R^2} + \frac{1}{R^3} = \frac{1}{100} + \frac{1}{50} + \frac{1}{500} = \frac{16}{500}$$

According to ohm's law

$$V = IR$$

$$I = V/R$$

Where, current flowing through the circuit I

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

$$= \frac{220}{500} = \frac{220/16}{50} = 7.04A$$

$7.04A$ of current is drawn by all the three given appliances. Therefore current drawn by an electric iron connected to the same source of potential $220V = 7.04A$

Let R^1 be the resistance of the electric iron : According to ohm's law

$$V = 1R^1$$

$$R^1 = \frac{V}{I} = \frac{220}{7.04} = 31.25\Omega$$

Therefore the resistance of the electric iron is 31.25Ω and the current flowing through it is $7.04A$

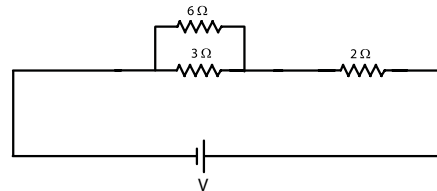
3. What are the advantages of connecting electrical device in parallel with the battery instead of connecting them in series?

Answer : There is no division of voltage among the appliances when connected in parallel. The potential difference across each appliance is equal to the supplied voltage. The total effective resistance of the circuit can be reduced by connecting electrical appliances in parallel.

4. How can three resistors of resistance 2Ω , 3Ω and 6Ω be connected to give a total resistance of a) 4Ω , b) 1Ω ?

Answer : There are three resistors of resistance 2Ω , 3Ω and 6Ω respectively.

a) The following circuit diagram shows the connectors of three resistors



Here 6Ω and 3Ω resistors are connected in parallel. The equivalent resistance given by

$$\frac{1}{R} = \frac{1}{6} + \frac{1}{3}$$

$$\frac{1}{R} = \frac{6 + 3}{6 \times 3}$$

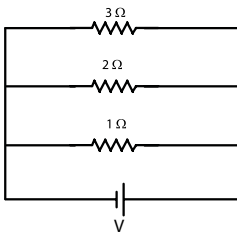
$$R = \frac{6 \times 3}{6+3} = \frac{18}{9} = 2\Omega$$

This equivalent resistor of resistance 2Ω is connected to a 2Ω resistor in series. Therefore, the equivalent resistance

of the circuit = $2\Omega + 2\Omega = 4\Omega$

Hence the total resistance of the circuit is 4Ω

b) The following circuit diagram shows the three resistors.



All the resistors are connected. Therefore their equivalent resistance will be given as

$$\frac{1}{R} = \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = \frac{3+2}{6} = \frac{1}{3} + 2 = \frac{6}{3} = 2 \Omega$$

Therefore the total resistance of the circuit is 1Ω

5. What is (a) the highest, (b) the lowest total resistance that can be secured by combinations of four coils of resistance 4Ω , 8Ω , 12Ω , 24Ω

Answer : There are four coils of resistance 4Ω , 8Ω , 12Ω and 24Ω and respectively

a) If these coils are connected in series then the equivalent resistance will be the highest given by sum = $4+8+12+24 = 48\Omega$

b) If these coils are connected in parallel, then the equivalent resistance will be the lowest given by

$$R = R_1 R_2 R_3 R_4$$

$$\frac{1}{R} = \frac{1}{4} + \frac{1}{8} + \frac{1}{12} + \frac{1}{24} = \frac{6+3+2+1}{24}$$

$$\frac{1}{R} = \frac{12}{24} \therefore R = \frac{24}{12} = 2 \Omega$$

Therefore 2Ω is the lowest total resistance.

Page no. 218

1. Why does the cord of an electric heater not glow while the heating element does?

Answer : The heating element of the heater is made up of alloy which has very high resistance. So when current flows through the heating element, it becomes too hot and glows red. But the resistance of cord which is usually of copper or aluminum is very low. So it doesn't glow.

3. An electric iron of resistance 20Ω takes a current of $5A$. Calculate the heat developed in $30s$.

Answer : The amount of heat (H) produced is given by the joule's law of heating as $H = VIt$ or I^2Rt

Current $I = 5A$

Time $t = 30s$

Voltage $V = \text{Current} \times \text{Resistance} = 5 \times 20 = 100 V$

$H = 100 \times 5 \times 30 = 1.5 \times 10^4 J$

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1. What determines the rate at which energy is delivered by a current?

Answer : The rate of consumption of electric energy in an electric appliances is called electric power. Hence the rate at which energy is delivered by a current is the power of the appliances

2. An electric motor takes $5A$ from a $220 V$ line. Determine the power of the motor and the energy consumed in $2h$

Answer : Power (P) is given by the expression $P = VI$

Where,

Voltage, $V = 220V$

Current, $I = 5A$

$P = 220 \times 5 = 1100 Wh$

Energy consumed by the motor = Pt

Time (t) = $2h = 2 \times 60 \times 60 = 7200 s$

$\therefore P = 100 \times 7200 = 7.92 \times 10^6 J$

or

$E = Pt = 1100W \times 2h = 2200Wh$

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2. Which of the following terms does not represent electrical power in a circuit?

- a) I^2R
- b) IR^2
- c) VI
- d) V^2/R

Answer : b) IR^2

3. An electric bulb is rated $220V$ and $100 W$. When it is operated on $110 V$, the power consumed will be

- a) $100W$
- b) $75W$
- c) $50W$
- d) $25W$

Answer : d) $25W$

4. Two conducting wires of the same material and of equal length and equal diameters are first connected in series and then parallel in a circuit across the same potential difference. The ratio of heat produced in series and parallel combination would be.

- a) $1:2$
- b) $2:1$
- c) $1:4$
- d) $4:1$

Answer : c) $1:4$

5. How is voltmeter connected in the circuit to measure the potential difference between two points?

Answer : To measure the potential difference between two points, a voltmeter should be connected in parallel to the points.

6. A copper wire has diameter $0.5 mm$ and resistivity of $1.6 \times 10^{-8} \Omega m$. What will be the length of this wire to make its resistance 10Ω . How much does the resistance change if the diameter is doubled?

Answer : Area of cross section of wire, $A = \pi (d/2)^2$

Diameter = $0.5mm = 0.0005m$

Resistance $R = 10\Omega$

We know that

$$R = \frac{\rho \ell}{A}$$

$$\ell = \frac{RA}{\rho} = \frac{10 \times 3.14 \times \left(\frac{0.0005}{2}\right)^2}{1.6 \times 10^{-8}}$$

$$= \frac{10 \times 3.14 \times 25}{4 \times 1.6} = 122.72 \text{ m}$$

Length of the wire = 122.72 m

If the diameter of the wire is doubled, new diameter

$$= 2 \times 0.5 = 1 \text{ mm} = 0.001 \text{ m}$$

Let new resistance be R^1

$$R^1 = \frac{\rho \ell}{A}$$

$$= \frac{1.6 \times 10^{-8} \times 122.72}{\pi(1/2 \times 10^{-3})^2}$$

$$= \frac{1.6 \times 10^{-8} \times 122.72 \times 4}{3.14 \times 10^{-6}}$$

$$= 250.2 \times 10^{-2} = 2.5 \Omega$$

Therefore the length of the wire is 122.7m and the new resistance is 2.5Ω

7. The values of current I flowing in a given resistance for the corresponding values of potential difference V across the resistor are given below

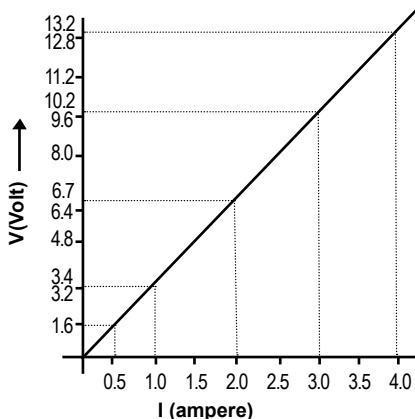
I (ampere)	0.5	1.0	2.0	3.0	4.0
V(volts)	1.6	3.14	6.7	10.2	13.2

Plot a graph between V and I and calculate the resistance of that resistor.

The plot between Voltage and Current is called IV characteristics. The voltage is plotted on X – axis and current is plotted on Y –axis. The values of the current for different values of the voltage are shown in given table.

I (ampere)	0.5	1.0	2.0	3.0	4.0
V(volts)	1.6	3.14	6.7	10.2	13.2

plot a graph between V and I and calculate the resistance of that resistors



The slopes of the line gives the values of resistance (R) as

$$\text{Slope } 1/R = BC/AC = \frac{2}{6.8}$$

$$\frac{6.8}{2} = 3.4 \Omega$$

8. When a 12V battery is connected across an unknown resistor, there is a current of 2.5 in the circuit. Find the value of the resistance of the resistor.

Answer : Resistance (R) of a resistor given by ohm's law as $V=IR$

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

Where potential difference $V=12V$

Current in the circuit $I = 2.5 \text{ mA} = 2.5 \times 10^{-3} \text{ A}$

$$R^1 = \frac{12}{2.5 \times 10^{-3}} = 4.8 \times 10^3 \Omega = 4.8 \text{ k } \Omega$$

Therefore the resistance of the resistor is 4.8 kΩ

9. A battery 9 V is connected in series with resistors of 0.2Ω, 0.3Ω, 0.4Ω, 0.5Ω and 12Ω respectively. How much current would flow through the 12Ω resistor.

Answer: There is no current division occurring in a series circuit. Current flow through the component is the same given by ohms law as

$$V = IR$$

$$I = V/R$$

Where R is the equivalent resistance of resistance 0.2Ω , 0.3Ω , 0.4Ω , 0.5Ω and 12Ω . These are connected in series. Hence the sum of the resistance will give the value of R

$$R = 0.2 + 0.3 + 0.4 + 0.5 + 12 = 13.4 \Omega$$

Potential difference, $V=9V$

$$I = 9/13.4 = 0.671A$$

Therefore the current that would flow through the 12Ω resistor is 0.671A

10. How many 176Ω resistor (in parallel) are required to carry 5A on a 22V line?

Answer : For X number of resistors of resistance 176Ω the equivalent resistance of the resistors connected in parallel is given by ohm's law

$$\text{As } V = IR$$

$$R = V$$

Where supply voltage $V = 220V$

Current, $I = 5A$

Equivalent resistance of the combination

R given as

$$\frac{1}{R} = X \times \frac{1}{176}$$

$$= \frac{176}{X}$$

$$\text{From, ohm's law } \frac{V}{1} = \frac{176}{X}$$

$$X = \frac{176 \times 1}{220} = \frac{176 \times 5}{220} = 4$$

Therefore four resistors of 176Ω are required to draw the given amount of current.

INFO JUNCTION



February 01, 2020

MOHAMMED ALLAWI

One of the former communication ministers of Iraq, Mr. Mohammed Allawi was appointed as the Prime Minister of the country. Allawi has been appointed the Prime Minister of the Country amidst long protests that has so far killed 600 in the country.



March 30, 2020

NASA ANNOUNCES SUNRISE MISSION

NASA announced Sun Radio Interferometer Space Experiment (SunRISE) mission. The mission is to study about how sun creates Giant Solar Particle Storms. The SunRISE mission will provide information on how the Sun's radiation affects the space environment and to understand the working of the solar system. The study will also aid future astronauts mission.



February 25, 2020

MOHAMMED HOSNI MUBARAK

The Egypt ruler Mohammed Hosni Mubarak died at the age of 91. He served as the President of Egypt between 1981 to 2011.



March 30, 2020

RAJASTHAN STATEHOOD DAY

Rajasthan celebrates its Statehood Day on March 30 every year.

Popularly known as "Land of the Kings", the day is also called "Rajasthan Day". This year, the state was silent due to the lock down in the country. Usually there were radiant and invigorating events held all across



March 21, 2020

SATYARUP SIDDHANTA

The Indian Mountaineer Satyarup Siddhanta has entered 'Limca Book of Records'. He has set the record of becoming the first Indian to climb the highest volcano in the world. He already holds Guinness Book of World Records, India Book of Records, Asia Book of Records, British Book of records and Champion Book of Records.



April 7, 2020

WORLD HEALTH DAY

April 7 is marked as the World Health Day every year. The day is marked to celebrate the work of midwives and nurses for their role in keeping the world safety and healthy. This year, 2020, has celebrated as International Year of Nurses and Midwives. The World Health Day is marked by World Health Organization along with several other organizations. The theme of the World Health Day is selected by WHO. Theme of 2020: Support Nurses and Midwives.



March 28, 2020

EARTH HOUR

Since 2007, every year millions of people participate in the campaign called "Earth Hour" in March. This year, it was celebrated on 28 March 2020. It is a symbolic movement of "Lights OFF" to save the environment. The event is organized by the World wide Fund. The event was first started in Sydney, Australia. The aim of marking Earth Hour is to give attention towards global warming, climate change and loss of biodiversity. During the one-hour campaign, all over the world switch off lights and electronic items between 8:30 PM to 9:30 PM. The Earth Hour is held every year on the last Saturday of March.



March 29, 2020

AIR VICE MARSHALL CHANDAN SINGH RATHORE

The Mahavir Chakra recipient Air Vice Marshall Chandan Singh Rathore died at his Jodhpur residence. His services during 1962 war and 1971 war were impeccable. He was honored with Mahavir Chakra for the same.



APRIL 9, 2020

INDIAN RAILWAY AGAINST COVID 19

Apart from converting its coaches into hospital beds, the Indian Railways has also launched isolation wards. Around 3,250 coaches have been converted into isolation wards. It has recruited 2,500 temporary doctors and 35,000 paramedic staffs. Around 5,000 beds have been identified for treatment in railway hospitals.

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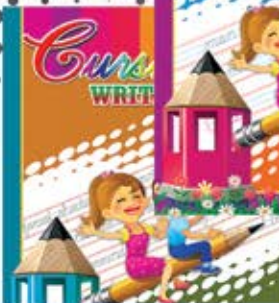
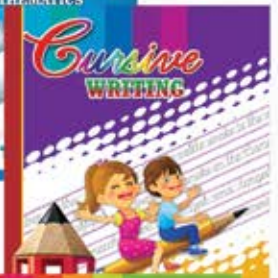
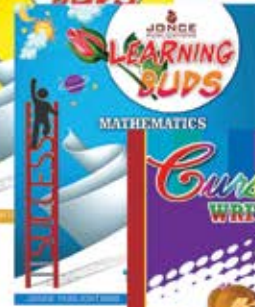
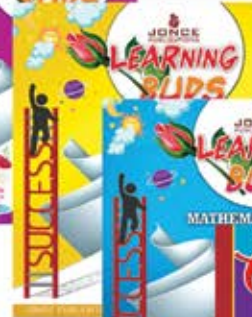
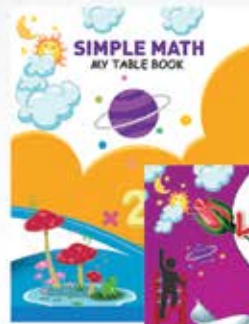
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