ELECTRICITY

LEARNING OBJECTIVES:

- Introduction
- About dry and button cells
- Car and phone batteries
- Conductor and its types
- Symbols in electric circuits
- Electric circuits and its types
- Series and Parallel connection of cells
- Precautions in using house hold electric appliances

Applications in real life:

Φ Electricity used in every ware, like house hold appliances, industrial appliances, agricultural appliances, schools, shopping malls…..ect

Φ Electricity is a very convenient way to transfer energy, and it has been adapted to a huge, and growing, number of uses

Φ The invention of a practical incandescent light bulb in the 1870s led to lighting becoming one of the first publicly available applications of electrical power.

Φ Electricity is used within telecommunications, and indeed the electrical telegraph, demonstrated commercially in 1837 by Cooke and Wheatstone, was one of its earliest applications

Φ Electronic devices make use of the transistor, perhaps one of the most important inventions of the twentieth century

Important formules

1. when cell are connected in series , then resultent Voltage is sum of all cells voltage in the circuit $E_R = E_1 + E_2 + E_{R3}$
2. When the cells of equal potential difference are connected in parallel, the effective potential difference is equal to the potential difference of any one of the cells.

$\therefore E = E_1 = E_2 = E_3$.

§§ **Introduction**

Θ Electricity travels along a path.

Θ The whole path along which electricity travels is known as a circuit.

Θ The flow of current from +ve terminal to -ve terminal is along the circuit.

Θ The flow of current from -ve terminal to +ve terminal is with in the cell.

Θ An unbroken path flow two terminals of an electric cell is known as a closed circuit.

Θ Electricity will flow in a closed circuit.

Θ A broken path is known as an open circuit in b/w the two terminals of an electric cell.

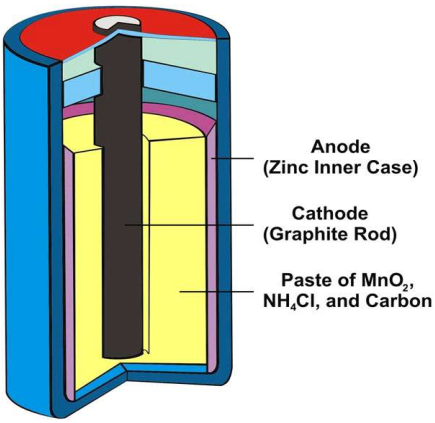
Θ Electricity will not flow in an open circuit.

Θ Electric current has electrical energy which comes from electric cells.

Θ Electric current from cells flows in one direaction only.

Θ A switch is a device to 'close' or 'open' a circuit.

§§ ***The Dry cell:*** A Dry cell is a type of **electricity-producing chemical cell**,commonly used today for many home and portable devices, often in the form of batteries.



* It was developed in 1886 by the German scientist Carl Gassner.
* Also Electric cell being used in torches, transistors, toys, watches, clocks, calculators and other electrical appliances.

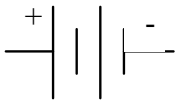
+ve terminal =Carbon rod

-ve terminal =zinc rod

electrolyte= Ammoniumchloride paste(NH_4Cl).

§§ ***Battery :***

* A combination of two (or) more cells is called a battery.
* A battery of cells is represented by the symbol



* A electric cells may be dry cells, button cells, batteries, accumulators (or) solarcells.

§§ ***Button cells:*** Buttoncells are small like a button. They are used in wrist watches, calculators, mini-microphones and the ear devices.

* These cells are made from nickel (Ni) and cadmium.
* They will give more electrical energy than large sized cells.
* They have longer life and occupy less space.

§§ **Car battery and a mobile phone battery:**

A car battery (or) the batteries being used in buses and trucks are a combination of one more cells inside.

* They can supply more current than a dry cell.
* They can be recharged with the help of an electric charger and used up again and again.
* For this property, these batteries are also called accumulators.

§§ ***Solar cells:*** Solar cell converts solar energy into electrical energy. This energy is used either directly (or) is stored in an accumulator.

§§ ***Conductors:*** The materials that allow electric current to pass through them.

Examples: Iron nail, copper wire, brass key, aluminium rod, pencil lead (graphite), mercury..etc.

* All metals are good conductors of electricity.
* Human body is good conductor of electricity.
* All liquids are bad conductors of electricity except mercury which is a liquid metal.
* Pure water is a bad conductor of electricity.

§§ ***Insulators (or) Non-conductors:***

The materials which does not allow electric current to pass through them.

Ex: Paper, wood, plastic, cloth, eraser (rubber), pure water....etc.

Conductors of electricity are coated with insulators to prevent leakage of electricity.,

§§ **Semiconductors:**

The materials which allows electricity partially to pass through them is called semiconductors
Ex: Silicon , germanium.. etc

§§ ***Symbols used in Electrical circuits:***

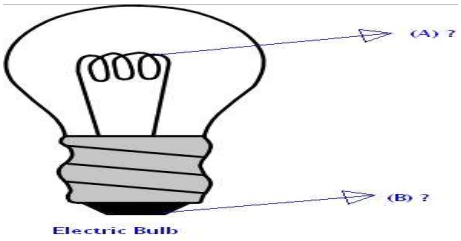
	Device	Symbol
1.	An electric cell	
2.	An electric bulb	
3.	A plug key (as a switch)	
4.	A tap key (as a switch)	
5.	A voltmeter	
6.	An Ammeter	
7.	A resistance	
8.	A Rheostat	
9.	A fuse	

TEACHING TASK

MCQ's with only one option is correct:

1. What is pointer 'A', as shown in figure of an electric bulb?
A) Element B) Filament
C) Holder D) Terminal

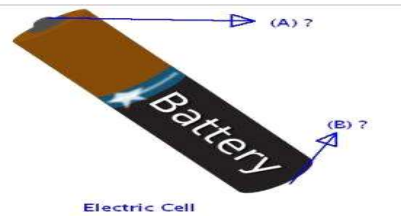
2. What is pointer 'B', as shown in figure of an electric bulb?
A) Element B) Filament
C) Holder D) Terminal



3. A simple device that is used to either break or complete the electric circuit, is called .
A) Switch B) Terminal C) Current D) Conductor

4. Electric Cell (Battery) as shown in the figure, pointer 'A' indicates
A) Filament B) Holder
C) Positive Terminal D) Negative Terminal

5. Electric Cell (Battery) as shown in the figure, pointer 'B' indicates
A) Filament B) Holder
C) Positive Terminal D) Negative Terminal



6. Materials which allow current to pass through them easily are called?
A) Insulators B) Conductors C) Switch D) Battery

7. ..... are materials that do not allow electric current to pass through them.

A) Insulators B) Conductors C) Switch D) Battery

8. Which one of the following statement is false?
A) Rubber is a bad conductor of electricity.
B) In general metals are good conductor of electricity.
C) Our body is a bad conductor of electricity.
D) The bulb glows only when current flows through the circuit.

9. Which one of the following will allow electric current to pass through?
A) Eraser B) Matchstick C) Plastic comb D) Iron Nail

10. An electric cell has .....terminals.
A) one B) two C) three D) four

11. Resistivity of a wire depends on
A) length B) material C) cross section area D) none of the above.

12. Combination of two or more cell in series is called
A) Dynamo B) Transistor C) Battery D) Insulator

13. Filament of electric bulb is made up of
A) Tungsten B) Iron C)Copper D) Aluminum

14. Which one is not a good conductor of electricity?
A) copper B) Silver C) Plastic D) Graphite

15. Closed and continues path of electric current is called
A) Resistance B) Circuit C) Connector D) Insulatorn

State wether the given statement are true/false and write correct statements:

16. Electric current can flow through metals.

17. Instead of metal wires, a jute string can be used to make a circuit.

18. Electric current can pass through a sheet of thermocol.

19. When current flows through a circuit, the circuit is called open circuit.

20. An electic bulb has one terminal.

Find the odd one out. Give a reason for your choices:

21. plastic, human,brass key,graphite

22. Battery, generater,bulb,button cell

23. corbon rod, switch, zinc rod,. Ammoniumchloride paste

24. Tourche, watch, battery,toys

Match the following

25.

a. Conductor	1. Obstruct the flow of current
b. Insulator	2. Used to close and open the circuit.
c. Resistor	3. Through which current pass easily.
d. Plug-key	4. Current does not pass at all.

A) a - 1, b -4,c - 2, d - 3 B) a -4 , b -1, c -2, d - 3
C) a- 3, b- 4 ,c- 1, d- 2 D) a - 2, b -3, c -1, d - 4

Comprehensive

The materials that allow electric current to pass through themare called conductor, the materials which does not allow electric current to pass through them are called insulater.

26. Which of the following is not an insulator?
a. Glass b. Plastic c. Graphite d. Rubber

27. Which metal is less conductor of electricity
a. Silver b. Iron c. Aluminum d. Mercury

LEARNER'S TASK

BEGINNERS (Level - I)

MCQ's with only one option is correct:

1. A cell converts
A) electrical energy into chemical energy
B) chemical energy into electrical energy
C) magnetic energy into electrical energy
D) electrical energy into mechanical energy

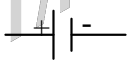
2. The cell used in wrist watch is
A) button cell B) solar cell C) car battery D) None

3. The electric current from a cell flows in
A) one direction B) two directions C) three directions D) all directions

4. Insulators
A) do not conduct electricity B) conduct electricity
C) conduct electricity at low temperatures D) conduct electricity at room temperature

5. Which of the following is an insulator
A) wood B) iron C) carbon D) silver

6. Metals are good conductors because
A) outer electrons are strongly bound to the atom
B) outer electrons are loosely bound to the atom
C) inner electrons are loosely bound to the atom
D) protons can detach from the nucleus and conduct electricity

7. Which of the following is a symbol of a cell
A)  B)  C)  D) 

8. Example for a conductor
A) rubber B) plastic C) copper D) wood

9. The device used to generate large amount of electricity is
A) electric cell B) storage battery C) solar cell D) electric generator

10. A fuse wire has a
A) very low melting point B) low melting point
C) high melting point D) very high melting point

11. The device used to open (or) close an electric circuit
A) switch B) bulb C) fuse D) resistance

12. Electric current will not flow in ..... circuit
A) open B) close C) both A and B D) none of these

13. Which of the following is symbol of resistance
A)  B)  C)  D) 

ACHIEVERS (Level - II)

Answer the following:

1. (i) Name two household electric appliances, which produce light.
(ii) Name four household electric appliances, which produce heat.
(iii) Name two office appliances, which use electricity.
(iv) Name two household appliances, which cause cooling effect.
(v) Name two industrial appliances, which use electricity.
(vi) Name four appliances, which do not work with electricity.

2. Name the source of electricity for a pocket calculator.

3. (i) How is the electricity for household use produced on large scale?
(ii) How does the above electricity reach our homes?

4. Draw a neat and labelled diagram of simple dry cell (Leclanche cell).

5. What do you understand by the following terms? Give four examples in each case.
(i) Conductors
(ii) Insulators

6. Pick out the conductors and insulators from the following list :
List : (i) glass, (ii) brass, (iii) ebonite, (iv) silver, (v) aluminium, (vi) syrup, (vii) gold, (viii) steel, (ix) salt solution, (x) wool, (xi) wood, (xii) rubber, (xiii) plastic, (xiv) copper, (xv) a rupee coin, (xvi) mica, (xvii) sulphur, (xviii) paper, (xix) air, (xx) human body.

EXPLORERS (Level - III)

State wether the given statement are true/false and write correct statements:

1. Voltaic cell converts chemical energy into electrical energy.

2. Wood is a good conductor of electricity.

3. Mercury is a good conductor of electricity.

4. In series circuit, if one appliance goes out of order, the other appliances stop working.

5. Bulb is the source of electricity in a torch.

Find the odd one out. Give a reason for your choices:

6. Copper, gold, wood, living plants.

7. Plastic, lead, aluminium, human body.

MATCH THE FOLLOWING:

⬥ *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in* ***Column–I*** *have to be matched with statements (p, q, r, s) in* ***Column–II****. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

8.

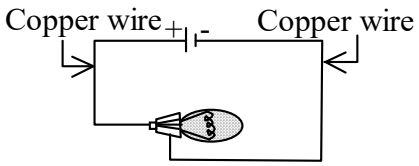
a. Torch	1.copper.
b. conductor	2 to get light.
c. bad conductor	3. to get air.
d. Fan	4 . Air

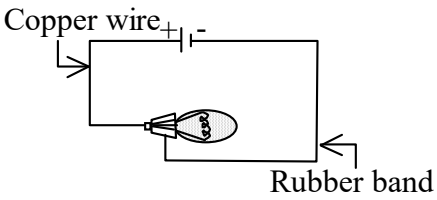
A) a - 1, b -4,c - 2, d - 3 B) a -4 , b -1, c -2, d - 3
C) a- 3, b- 4 ,c- 1, d- 2 D) a - 2, b -1, c -4, d - 3

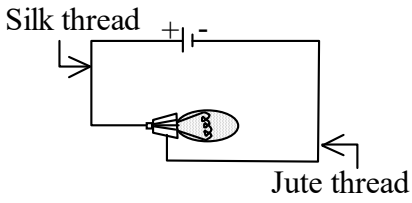
MCQ's with more than one option is correct:

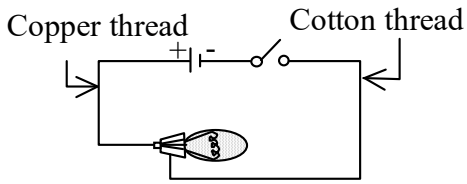
⬥ *This section contains multiple choice questions. Each question has 4 choices (A), (B), (C),(D), out of which* ***ONE or MORE*** *is correct. Choose the correct options*

9. Find out which circuit lights will not glow ?

A) 

B) 

C) 

D) 

10. Example for conductors of electricity
A) graphite B) Alcohol C) Salt solution D) Mercury.

11. Example for insulators of electricity
A) wood B) lead C) Salt solution D) glass.

12. Example for conductors of electricity
A) living plants B) brass C) impure water D) gold.

13. Example for insulators of electricity
A) leather B) cork C) nylon D) pure water.

Comprehension

- *This section contains paragraph. Based upon each paragraph multiple choice questions have to be answered. Each question has 4 choices (A) , (B) ,(C) and (D) out of which **ONLY ONE i**s correct. Choose the correct option.*

The materials which does not allow electric current to pass through themare called insulater.
The materials which allows electricity partially to pass through them is called semiconductors.

14. Which of the folloing is semiconducter
A) graphite B) Silicon C) Salt solution D) Mercury.

15. which of the following will not allows current pass through it
A) living plants B) brass C) Wood D) gold.

Fill in the blanks:

16. The source of electricity for torches is .....

17. The path along which electric current flows is called .....

18. An unbroken path of electric circuit is called ..... circuit

19. A broken path of electric circuit is called circuit .....

20. The materials which allow electric current to flow through them are called .....

21. Symbol used to represent rheostat is .....

22. Electric heater converts electrical energy into ..... energy

23. Accumlator means .....

24. The combination of two (or) more cells is called .....

25. solar cell converts ..... into ..... energy.

KEY

ΦΦ TEACHING TASK :

1)B 2)C 3)B 4)C 5)D 6)A 7)A 8)C 9)D 10)B 11)A) 12)C
13)A 14)C 15)B 16)T 17)F 18) 19)F 20)F 21) plastic 22)bulb
23)switch 24)battery 25) C 26) c 27) d

ΦΦ LEARNER'STASK :

☐ **BEGINNERS :**

1)B 2)A 3)A 4)A 5)A 6)B 7)B 8)C 9)D 10)B 11)A 12)A 13)A

☐ **EXPLORERS :**

1) T 2) F 3) F 4) T 5) F 6) wood 7) plastic 8) D 9) a , c 10) a , c
11) a , d 12) a , b , c , d 13) a , b , c ,d 14) b 15) c 16) cells
17) circuit 18) closed 19) open 20) conductor 21) heat
22) battery 23) light to electric

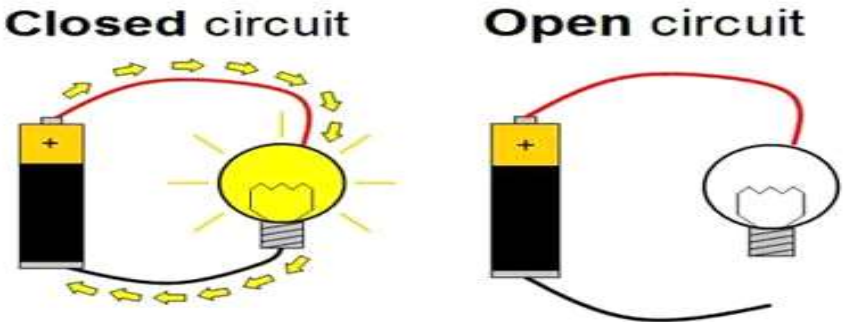
§§ ***Electric circuit:*** The path along which electric current flows is called electric circuit.

§§ ***Closed circuit:*** When the path which starts from one terminal of the cell, ends at the other terminal of the cell, without any break, then such a circuit is called complete circuit (or) closed circuit.Electric current flows only in closed circuits.

§§ ***Open circuit:***

When the path of current, starting from one terminal of the cell to another terminal of the cell is broken (or) incomplete, then such a circuit is called open circuit (or) in complete circuit.

Fuses and miniature circuit breakers break an over loaded electric circuit and prevent electric fire.



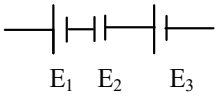
§§ ***Electromotive force:***

Electromotive force, also called emf (denoted E and measured in volts),

* It is the voltage developed by any source of electrical energy such as a battery or dynamo.
* It is generally defined as the electrical potential for a source in a circuit. A device that supplies electrical energy is called a seat of electromotive force or emf.
* Emfs convert chemical, mechanical, and other forms of energy into electrical energy. The product of such a device is also known as emf.

* The word "force" in this case is not used to mean mechanical force, measured in newtons, but a potential, or energy per unit of charge, measured in volts.

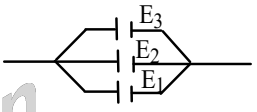
§§ ***Electric cells in series:*** When the negative terminal of first cell is connected to the positive terminal of thenext cell and so on, then the cells are said to be in 'series combination'.



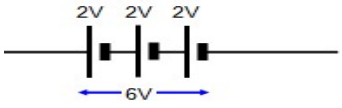
1. When cells are connected in series, the total potential difference of the combination is the sum of the potential differences of in individual cells. i.e. $E = E_1 + E_2 + E_3$.
2. When the bulbs are connected in series, if one of them fused(or) removed, all the others stop working because the circuit becomes open.

§§ ***Electric cells in Parallel:***

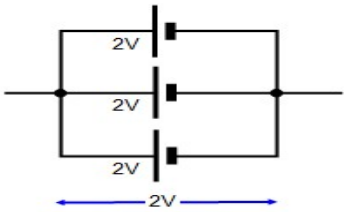
When all the positive terminals of two (or) more cells are connected to a single point and similarly all the negative terminals are connected to another single point, then the cells are said to be connected in parallel.



1. When the cells of equal potential difference are connected in parallel, the effective otential difference is equal to the potential difference of any one of the cells. $\therefore E = E_1 = E_2 = E_3$.
2. When the cells of different potential difference are connected in parallel, the effective potential difference is equal to the potential difference of the cell having the highest potential difference. $E = E_1$ when $E_1 > E_2 > E_3$.
3. When bulbs are connected in parallel, if one bulb is fused (or) removed, the others continue to work.



Sum of all cells voltage



Highest voltage among all cells

¶¶ ***Precautions in using house hold electric appliances:***

Following precautions can save us from receiving electric shocks:

1. Do not put your finger or any metallic object in the sockets.
2. Do not touch the switches on main board.
3. Do not touch metal part of any electric appliance, such as table fan; heater; fridge, air cooler with bare hands when they are working.
4. Do not touch switches with wet hands.
5. Always use three pin plug for movable appliances. The bigger pin in this plug is earth connection. It protects the user from receiving an electric shock.
6. While ironing clothes always stand on a rubber mat or wooden board.
7. Do not try to repair an electric circuit by guess work. It can cause serious accidents.
8. Always use a good quality insulating tape while joining copper wires.

9. Do not touch electric poles with bare hands, especially in the rainy season. Sometimes, the current leaks through them and can give nasty shock.Electricity is a form of energy which helps us with
   a) heat effect b) light effect c) magnetic effect.

TEACHING TASK

I. MCQ's with only one option is correct:

1. 5 cells each of 1V are connected in series then what is the effective voltage of the circuit
A) 9 B) 5 C) 6 D) 15

2. Three cells each of 1.5 V are connected in series what is the effective voltage of the circuit ?
A) 4.5 V B) 1.5 V C) 1.5 V D) 3 V

3. How many 1.5 V cells would you have to connect in series to obtain a voltage of 9 V ?
A) 9 B) 5 C) 6 D) 15

4. Three cells of voltage 1.5 V, 2 V and 3 V are connected in series. Calculate the output voltage of the circuit ?
A) 3 V B) 1.5V C) 2.16 V D) 6.5 V

5. How many 4.5 V cells would you have to connect in series to obtain a voltage of 9 V ?
A) 2 B) 4 C) 6 D) 1

6. Three cells of voltage 1.5 V, 2 V and 3 V are connected in parallel. Calculate the output voltage of the circuit ?
A) 2 B) 3 C) 6 D) 9

7. 10 cells each of 0.1V are connected in series ? what is the effective voltage of the circuit
A) 1 B) 2 C) 3 D) 4

II. Fill in the blanks.

1. When a short-circuit takes place, the fuse wire melts and breaks the……

2. If a person touches a live wire, he gets a severe ……

3. The electric meters in our houses measure the electrical energy consumed in ……

4. Charge will flow from one body to another body only when there is a……between them.

5. The …… is considered to be at zero potential.

6. A live wire is …… in colour.

7. The overheating of electrical wiring in any circuit due to the flow of large current though it is called……of electric circuit.

8. A flow of very large current due to the direct contact of a live and aneutral wire is called_____.

9. The flow of charge per unit time through a conductor is called…..

10. The level of charge per unit time on a body is called ……of the body.

11. The voltmeter is an instrument used to measure……

12. The dry cell was invented by……

13. Electricity moves only in a…… circuit.

14. When we turn the switch to the off position the circuit is ……

15. When you remove a bulb from a three bulb circuit, and the other two bulbs go off, then the bulbs must have been be connected in……

16. When you attach a wire to both terminals of a dry cell, the electrons flow from the …… terminal to……terminal.

17. …… and …… are semi-conductors.

III. ***State wether the given statement are true/false and write correct statements:***

1. A bulb is the source of electricity in a torch.

2. We can light a house by using electric cells.

3. Electricity can kill a person.

4. Earth connection protects user from receiving shocks.

5. We should not touch switches with bare hands.

6. Metals are good conductors of electricity.

7. A bulb lights up only when current flows through it.

Find the odd one out. Give a reason for your choices:

8. ebonite, alcohol, plastic, mercury.

9. copper, salt water, cotton, human body.

10. electric cell, storage cell, electric geyser, electric generator.

11. water heater, electric iron, series cells, tube light.

Match the following

- *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

12.

a. electric charge	1) volt
b. potential difference	2) coulomb
c. series cells	3) Highest voltage
d. parallel cells	4) Sum of voltage

A) a - 1, b -4,c - 2, d - 3 B) a -4 , b -1, c -2, d - 3

C) a- 3, b- 4 ,c- 1, d- 2 D) a - 2, b -1, c -4, d - 3

Comprehension

- *This section contains paragraph. Based upon each paragraph multiple choice questions have to be answered. Each question has 4 choices (A) , (B) ,(C) and (D) out of which **ONLY ONE i**s correct. Choose the correct option.*

When the cells of equal potential difference are connected in parallel, the effective potential difference is equal to the potential difference of any one of the cells.When the cells of different potential difference are connected in parallel, the effective potential difference is equal to the potential difference of the cell having the highest potential difference.

13. Three cells of voltage 5 V, 9 V and 11 V are connected in parallel. Calculate the output voltage of the circuit ?

A) 4 V B) 5V C) 11 V D) 25 V

14. 100 cells of each of 1V are connected in parallel ? what is the effective voltage of the circuit ?

A) 1 B) 2 C) 3 D) 4

15. 3V cell and 3V cell and 3V are connected in parllell. Calculate the output voltage of the circuit ?

A) 1 V B) 3 V C) 7 V D)11 V

LEARNER'S TASK

BEGINNERS (Level - I)

MCQ's with only one option is correct:

1. How many 2 V cells would you have to connect in series to obtain a voltage of 20 V ?
A) 9 B) 10 C) 11 D) 13

2. How many 11V cells would you have to connect in series to obtain a voltage of 220 V
A) 10 B) 14 C) 18 D) 20

3. How many 3V cells would you have to connect in series to obtain a voltage of 54 V ?
A) 10 B) 14 C) 18 D) 20

4. How many 1.5V cells would you have to connect in series to obtain a voltage of 15 V
A) 9 B) 10 C) 11 D) 12

5. Three cells of voltage 5 V, 9 V and 11 V are connected in series. Calculate the output voltage of the circuit ?
A) 4 V B) 5V C) 16 V D) 25 V

6. Six cells of voltage 1V and four cells of voltage 2 V and ten cells of 3 V are connected in series. Calculate the output voltage of the circuit ?
A) 11 V B) 44 V C) 22 V D) 33 V

7. 15 cells of voltage 5V and 10 cells of voltage 9 V and 5 cells of 11 V are connected in series. Calculate the output voltage of the circuit ?
A) 110 V B) 440 V C) 220 V D) 330 V

8. 10 cells of voltage 100V and five cells of voltage 200 V and four cells of 50 V are connected in series. Calculate the output voltage of the circuit ?
A) 1.1 KV B) 4.4 K V C) 2.2 KV D) 3.3 KV

9. 1V cell and 2V cell and 3V are connected in parllell. Calculate the output voltage of the circuit ?
A) 1 V B) 2 V C) 3 V D) 4 V

10. 2V cell and 3V cell are connected in parallel and two 2V cells are connected in series to this. Calculate the output voltage of the circuit ?
A) 3 V B) 5 V C) 7 V D) 9 V

11. 1V cell and 1.5V cell and 3 V are connected in parllell. Calculate the output voltage of the circuit ?
A) 1 V B) 2 V C) 3 V D) 4 V

12. 9V cell and 11V cell and 5V are connected in parllell.Calculate the output voltage of the circuit?
A) 1 V B) 5 V C) 7 V D)11 V

13. 10 cells of each of 1V are connected in parallel ? what is the effective voltage of the circuit ?
A) 1 B) 2 C) 3 D) 4

14. 12 cells each of 9V are connected in parallel ? what is the effective voltage of the circuit
A) 12 B) 9 C) 7 D) 5

15. Electrical work done per unit time is
A) electrical energy B) electrical current
C) electrical power D) electrical circuit

16. One megawatt is equivalent to
A) 10^2 W B) 10^6 W C) 10^4 W D) 10^8 W

17. Electric current is the flow of
A) Electrons B) protons C) neutrons D) none

18. A person gets a severe electric shock on touching

A) a neutral wire B) a live wire C) an earth wire D) none

19. Potential difference between any two points is measured in

A) volts B) joules C) coulombs D) none

20. All wires used in electric circuits should be covered with

A) a coloured material B) an insulating material

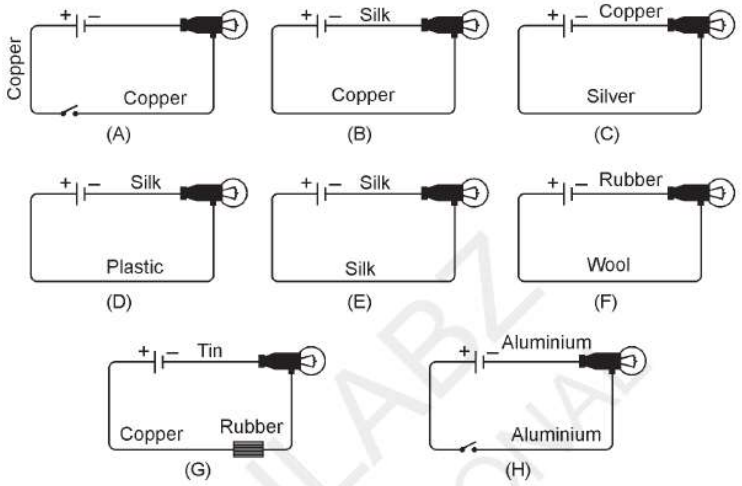
C) a conducting material D) none of these

ACHIEVERS (Level - II)

Answer the following:

1. An electric fan is placed in an open electric circuit. Will the fan work or not? Give a reason for your answer.

2.



Figures (A) to (H), show an electric circuit through a cell and an electric bulb. State your observations in each case and give one reason.

EXPLORERS (Level - III)

State wether the given statement are true/false and write correct statements:

1. Ordinary tap water does not conduct electric current.

2. Ebonite is good conductor of electricity.

3. Electricity used in homes is generated from storage cells.

4. Earth connection allows the excess electricity to flow into earth.

5. When the path of electric current starting from one terminal to other terminal is broken, then the electric circuit is known as closed circuit.

6. In an open electric circuit, the electricity flows through all its constituting elements.

7. In series circuit, all appliances work independently.

Find the odd one out. Give a reason for your choices:

8. Water heater, electric kettle, electric iron, electric fuse

9. Dry cell, solar cell, generator, electric bulbs

Match the following.

♦ *This section contains Matrix-Match Type questions. Each question contains statements given in two columns which have to be matched. Statements (A, B, C, D) in **Column–I** have to be matched with statements (p, q, r, s) in **Column–II**. The answers to these questions have to be appropriately bubbled as illustrated in the following example.*

*If the correct matches are A-p,A-s,B-r,B-r,C-p,C-q and D-s,then the correct bubbled 4*4 matrix should be as follows:*

10. a. electric power 1) ampere
b. current 2) joule
c. resistance 3) watt
d. electrical energy 4)ohm

A) a - 1, b -4,c - 2, d - 3 B) a -4 , b -1, c -2, d - 3
C) a- 3, b- 1 ,c- 4, d- 2 D) a - 2, b -1, c -4, d - 3

Comprehension

- *This section contains paragraph. Based upon each paragraph multiple choice questions have to be* answered. Each question has 4 choices (A) , (B) ,(C) and (D) out of which ***ONLY ONE i****s correct. Choose the correct option.*

When the negative terminal of first cell is connected to the positive terminal of the next cell and so on, then the cells are said to be in 'series combination'.

11. Three cells each of 2.5 V are connected in series what is the effective voltage of the circuit ?
A) 4.5 V B) 7.5 V C) 1.5 V D) 3 V

12. How many 1.5 V cells would you have to connect in series to obtain a voltage of 12 V ?
A) 9 B) 5 C) 6 D) 8

Fill in the blanks:

13. The source of electric current for hand held transistor is .....
14. Electricity used in homes is generated in .....
15. An electricity generating machine consists of a turbine and a .....
16. The substance which allows ..... to flow through it is called
17. A closed circuit has its every part made of .....
18. ..... is the source of electricity for pocket calculator.
19.. A bulb placed in ..... electric circuit glows.
20. An electric circuit is made by ..... switch.

RESEARCHERS (Level - IV)

MCQ's with only one option is correct:

1. Three resistors R_1,R_2,R_3 are ins series with each other $R_1<R_2<R_3$. The current through R_1 is i. Which statement is true ? **[KWEST 2011]**
a) R_1 has largest potential difference across it.
b) R_3 has largest potential difference across it.
c) The potential difference across each register is same.
d) The power dissipated by each resister is same.

2. The terminal voltage of a emf are in series 4V and 3V. Find the current in the circuit and internal resistance is 5 Ω. **[NSTSE 2010]**
a) 1.4A b) 1.60 A c) 1.57 A d) 2.67 A

3. Find the total resistance of 3 resistors, each if 3 Ω, connected in parallel **[KWEST 2011]**
a) 1 Ω b) 0 Ω c) 11 Ω d) 21 Ω

4. What does a battery contain ? **[KWEST 2011]**
a) A maximum of two cells b) A minimum of two cells
c) A cell & a switch d) A bulb & a switch

5. Electric lights will not come on unless their electrical circuit is **[NSTSE2009]**
a) parallel b) closed c) short d) series

6. Electricity travelling through a wire is an example of **[KWEST 2009]**

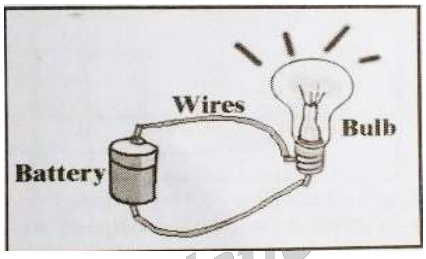
a) a force applied by a simple machine
b) Energy flowing through the water cycle
c) Earths grvitational pull on an object
d) Energy being transferred from place to place.

7. A electric bulb gives us light due to **[NSTSE 2009 & KWEST 2010]**
a) heating effect of current b) magnetic effect of current
c) chemical effect of current d) none

8. The bulb in a circuit glows when electric current **[KWEST 2010]**
a) flows through its filament b) flows through the glass covering
c) stops flowing to the bulb d) flows into the air through the bulb

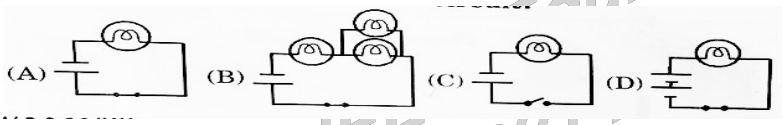
9. What is the source of electricity used by satellites ? **[NSTSE 2009]**
a) Dry cell b) Dynamos c) solar cells d) Accumulators

10. In the circuit given below, thye wires connecting the bttery and the bulb create a closed circuit. **[NSTSE 2011]**

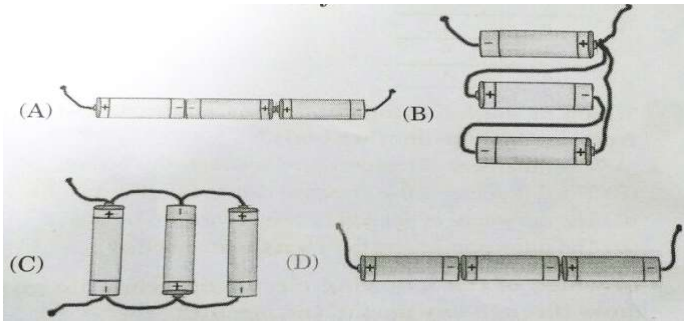


What happens if one of the these wires were cut?
a) The connecting wires losed charge
b) The glass would crack
c) The bulb stops glowing
d) The wire would become hot

11. In which of the follonig circuit diagram, no current flowes through any part of the circuit **[NSTSE 2011]**



12. Rana' techer asked him to connect 3 cells in diffrent ways from a battery. identify the correct way he must connect to from battery. **[NSTSE 2011]**



KEY

ΦΦ TEACHING TASK :

I. 1) B, 2) A, 3) C, 4) D 5) A, 6) B, 7) A

II. 1. Circuit 2. electric shock 3. kilowatt-hour 4. differnce in the potential
5. Earth 6. Red 7. Overloading 8.short circuit
9.electric current 10 potential difference 11. potential difference 12 leclanche
13. closed 14.open 15. series circuit 16.negative, positive
17.Germanium, silicon

III. 1) F 2) F 3)T 4)T 5)T 6)T 7)T 8) Plastic 9) cotton
10)Electric generator 11)series cells 12) D 13)C 14) A 15) B

ΦΦ LEARNER'STASK :

☐ **BEGINNERS :** *1) b 2) d 3) c 4) b 5) d 6) b 7) c 8) c 9)c 10) c*
11) c 12) d 13) a 14) b 15)c 16) b 17)a 18) b 19) a 20) c

☐ **EXPLORERS :**

1)F 2)T 3) F 4)T 5) F 6)F 7)F 8) Electric fuse
9) Generater 10)C 11)B 12) D 13) cells 14) power house
15) dynamo 16) electric current, conductor 17) conducting material
18) button cell 19) closed 20) closing

☐ **RESEARCHERS :** 1.a 2.a 3.a 4.b 5.b 6.d 7.a 8.a 9.c 10.c
11.c 12.d