**Class- X Session - 2022-23**

**Subject - Science (086)**

**Sample Question Paper - 8**

**with Solution**

**Max. Marks: 80** **Time Allowed: 3 hours**

**General Instructions:**

i. *This question paper consists of 39 questions in 5 sections.*
ii. *All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*
iii. ***Section A** consists of 20 objective type questions carrying 1 mark each.*
iv. ***Section B** consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.*
v. ***Section C** consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words*
vi. ***Section D** consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.*
vii. ***Section E** consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

## Section A

1. The heat produced in a wire of resistance **x** when a current **y** flows through it in time **z** is given by: **[1]**

   a) $y \times z \times x$ b) $x^2 \times y \times z$

   c) $x \times z \times y^2$ d) $y \times z^2 \times x$

2. A portion of each of four destarched leaves of a plant was covered with paper strips of various kinds. The plant was exposed to sunlight for 5 hours. There after the strips were removed and the leaves tested for starch in the covered portion. Which one out of the four leaves gave the starch test in the covered portion? **[1]**

   a) That covered with white paper strip.
   b) That covered with green paper strip.
   c) That covered with a transparent paper strip.
   d) That covered with black paper strip.

3. Permanent magnets are made of **[1]**
   A. Steel
   B. Alnico
   C. Nipermag
   D. Tungsten

   a) A and B b) A, B and D

   c) A, B and C d) A and D

4. Roasting is a method of heating ore: **[1]**

a) In the absence of water
b) In the presence of water
c) In the absence of air
d) In the presence of air

5. Soap doesn't work well with woollen garments because: **[1]**

A. It is basic in nature and woollen garments have acidic dyes.

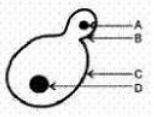
B. It is acidic in nature and woollen garments have basic dyes.

a) None of these
b) (A)
c) (B)
d) Both (A) and (B)

6. The principle of inheritance of acquired characters was given by **[1]**

a) Weismann
b) Darwin
c) Hugo De Vries
d) Lamarck

7. In the figure of budding in Yeast given above, structures A, B, C and D should be labelled respectively as **[1]**




a) nucleus of bud, bud, yeast, nucleus
b) nucleus of bud, bud, yeast, dividing nucleus of yeast
c) dividing nucleus of bud, bud, yeast, nucleus
d) dividing nucleus of yeast, yeast, bud, nucleus of bud

8. $HNO_3$ is a strong acid because: **[1]**

a) None of these
b) It doesn't dissociate into ions at all
c) It dissociates partially in aqueous solution
d) It dissociates completely in aqueous solution

9. Find the correct statement: **[1]**

A. Plant raised by vegetative propagation can bear flowers and traits earlier than those produced from seeds.

B. Plants grown using tissue culture technique are highly prone to diseases.

C. A plant grown by vegetative propagation is not prone to diseases.

a) (B)
b) (C)
c) (A)
d) All of these

10. Which of the following statements is not correct? **[1]**

a) Some metals react with acids to give salt and hydrogen.

b) Some non metal oxides react with water to form an acid.

c) All metal carbonates react with acid to give a salt, water and carbon dioxide.

d) All metal oxides react with water to give salt and acid.

11. In peas, a pure tall plant (TT) is crossed with a short plant (tt). The ratio of pure tall plants to short plants in $F_2$ is **[1]**

a) 3 : 1

b) 1 : 1

c) 1 : 3

d) 2 : 1

12. A ray of light is incident on a glass slab at an angle of incidence of 60 degree. If the angle of refraction be 32.7 degree. What will be refractive index of glass assuming sin 60 degree = 0.866 and sin 32.7 degree = 540? **[1]**

a) 1.603

b) None of these

c) 1.327

d) 1.540

13. If the charge on an electron is $1.6 \times 10^{-19}$ coulombs, how many electrons should pass through a conductor in 1 second to constitute 1 ampere current? **[1]**

a) $6.25 \times 10^{-18}$

b) $6.35 \times 10^{-18}$

c) None of these

d) $6.25 \times 10^{-19}$

14. The melting point of NaCl is: **[1]**

a) 100 K

b) 1000 K

c) 1074 K

d) 1047 K

15. In binary fission, the parent cell divides by the process: **[1]**

a) The nucleus first divides then cytoplasm

b) The cytoplasm and nucleus do not divide

c) The cytoplasm first divides then nucleus

d) Cytoplasm and nucleus divide at same time

16. How does a gaseous exchange take place in woody plants? **[1]**

a) Epidermal cells

b) Stem hair

c) Lenticels

d) Root hair

17. **Assertion (A):** Magnetic field lines never intersect. **[1]**
**Reason (R):** At a particular point magnetic field has only one direction.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

18. **Assertion (A):** Units that make up the nervous system are called neurons. **[1]**
**Reason (R):** Nerve impulses are carried by dendrites towards the cell body.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

19. **Assertion (A):** In water, Hydrochloric acid behaves as a weak monobasic acid. **[1]**
**Reason (R):** In water, Hydrochloric acid acts as a proton donor.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** Abiotic component of an ecosystem involves cycling of material and flow of energy. **[1]**
**Reason (R):** This is essential to keep biotic factors alive.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

## Section B

21. Which signal will get disrupted in case of a spinal cord injury? **[2]**

22. i. Covalent bonds formed as a result of sharing of electron pairs between two atoms are strong in nature. But the covalently bonded molecules have low melting and boiling points compared to the ionic molecules. What is the reason behind such behaviour? **[2]**

ii. Why are the unsaturated carbon compounds more reactive than saturated carbon compounds?

OR

Name two forms of alcohol which are poisonous.

23. What is meant by an Ecosystem? Name its components. **[2]**

24. Why does the food chain consists of few steps only? **[2]**

25. What will be the formula and electron dot structure of cyclopentane? **[2]**

26. We wish to obtain an erect image of an object, using a concave mirror of focal length 15 cm. What should be the range of distance of the object from mirror? What is the nature of image? Is the image larger or smaller than the object? Draw a ray diagram to show the image formation in this case. **[2]**

OR

Draw ray diagram showing the image formation by a convex lens when an object is placed at infinity.

## Section C

27. A pencil when dipped in water in a glass tumbler appears to be bent at the interface of air and water. Will the pencil to be bent to the same extent, if instead of water we use liquids like, kerosene or turpentine? Support your answer with reasons. **[3]**

28. A solution of a substance 'X' is used for whitewashing **[3]**

i. Name the substance 'X' and writes its formula.

ii. Write the reaction of the substance 'X' named in (i) above with water.

29. DNA copies generated during reproduction will be similar but may not be identical to the original. justify this statement. **[3]**

OR

Ravi took three bread slices and kept them in the following conditions

i. Slice 1 in a dry and dark place

ii. Slice 2 in moist and dark place

iii. Slice 3 in moist and in refrigerator

What would he observe in each of the above conditions? Give reasons for your answer.

30. When one enters a less lighted room from a place of intense light, he is not able to see anything for sometime, but after sometime the things become somewhat visible. Explain how this happens? **[3]**

31. A man with type A blood has a wife with type B. They have a child with type O blood. Give the genotype of all the three. What other blood groups can be expected in the future offspring of this couple? **[3]**

OR

In human beings, the statistical probability of getting either a male or female child is 50:50. Give a suitable explanation for this.

32. i. State two main causes of a person developing near-sightedness. With the help of a ray diagram, suggest how he can be helped to overcome his disability? **[3]**

ii. The far point of myopic person is 100 cm in front of the eye. Calculate the focal length and power of a lens required to enable him to see distant objects clearly.

33. Aluminium is a reactive metal but is still used for packing food articles. Why? **[3]**

## Section D

34. Carbon cannot reduce the oxides of sodium, magnesium, and aluminium to their respective metals. Why? Where are these metals placed in the reactivity series? How are these metals obtained from their ores? Take an example to explain the process of extraction along with chemical equations. **[5]**

OR

Explain the following

a. Reactivity of Al decreases if it is dipped in $HNO_3$

b. Carbon cannot reduce the oxides of Na or Mg

c. NaCl is not a conductor of electricity in solid state whereas it does conduct electricity in aqueous solution as well as in molten state

d. Iron articles are galvanised.

e. Metals like Na, K, Ca and Mg are never found in their free state in nature.

35. Give magnetic field due to solenoid. On what factors the strength of the field depends? **[5]**

36. List the steps of preparation of a temporary mount of a leaf peel to observe stomata. **[5]**

OR

Draw the sectional view of the human heart and label the following parts given below:

i. Chamber where oxygenated blood from lungs is collected.

ii. The largest blood vessel in our body.

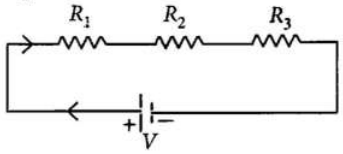
iii. The Muscular wall separating the right and left chambers.

iv. The blood vessel that carries blood from the heart to the lungs.

## Section E

37. **Read the text carefully and answer the questions:** **[4]**

Two or more resistances are connected in series or in parallel or both, depending upon whether we want to increase or decrease the circuit resistance.



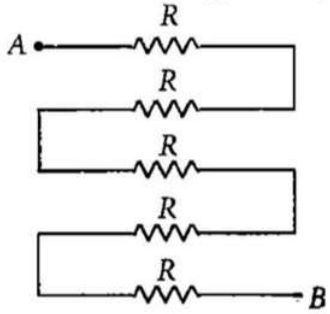

The two or more resistances are said to be connected in series if the current flowing through each resistor is the same.

(i) When the three resistors each of resistance R ohm are connected in series then what will be the equivalent resistance?

(ii) There is a wire of length 20 cm and having resistance 20 Ω cut into 4 equal pieces and then joined in series. What is equivalent resistance?

**OR**

In the following circuit, find the equivalent resistance between A and B (R = 2Ω)




38. **Read the text carefully and answer the questions:** **[4]**

Salt of a strong acid and strong base is neutral with a pH value of 7. NaCl common salt is formed by a combination of hydrochloride and sodium hydroxide solution. This is the salt that is used in food. Some salt is called rock salt, bed of rock salt was formed when seas of bygone ages dried up. The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, and bleaching powder.

(i) If given acids are phosphoric acid, carbonic acid, hydrochloric acid and sulphuric acid, then which acid does not form an acidic salt?

(ii) What is the formula of baking soda?

(iii) Name the substance which on treatment with chlorine to obtain bleaching powder.

**OR**

Which salt is used for removing the permanent hardness of water?

39. **Read the text carefully and answer the questions:** **[4]**

We have seen that the different parts of our body have specific functions. Our mouth waters when we see the food we like without our meaning to. Our heart's beat without our thinking about it. In fact, we cannot control these actions easily by thinking about them even if we wanted to. So, in between the simple reflex actions like change in the size of the pupil, and the thought out actions such as moving a chair, there is another set of muscle movements over which we do not have any thinking control. Many of these involuntary actions are controlled by the mid-brain and hind-brain. All these involuntary actions including blood pressure, salivation and vomiting are controlled by the medulla in the hind-brain. Think about activities like walking in a straight line, riding a bicycle, picking up a pencil. These are possible due to a part of the hind-brain called the cerebellum. It is responsible for the precision of voluntary actions and maintaining the posture and balance of the body. Imagine what would happen if each of these events

failed to take place if we were not thinking about it.

(i) Identify the part of the nervous system which controls the reflex action.

(ii) Does reflex action involve all parts of the voluntary nervous system?

(iii) Identify the part of the autonomic nervous system which controls involuntary actions.

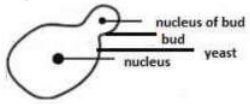
**OR**

**Beating of heart muscles**, which type of action is this? Out of voluntary and involuntary action which is slower?

# Solution

## Section A

1. **(c)** $x \times z \times y^2$
   **Explanation:** $x \times z \times y^2$
2. **(c)** That covered with a transparent paper strip.
   **Explanation:** That covered with a transparent paper strip.
3. **(c)** A, B and C
   **Explanation:** **Magnets are made** from magnetic metals – iron, nickel and cobalt. These are the only pure metals that can be turned into a **permanent magnet**. **Steel** is an alloy of iron and so can also be **made** into a **magnet**. **Alnico** and Nipermag alloys are ferromagnetic, with a high coercivity (resistance to loss of magnetism) and are **used to make permanent magnets**.
4. **(d)** In the presence of air
   **Explanation:** Roasting is heating of an ore in a regular supply of air in a furnace.
5. **(b)** (A)
   **Explanation:** Soap is basic in nature. Acid dyes are used to dye protein fibres such as silk, wool, angora, mohair, feathers, etc. Hence, soap doesn't work well with woolen garments. The soap gets neutralized by the acidic dyes.
6. **(d)** Lamarck
   **Explanation:** Lamarckism - Theory of Inheritance of Acquired Characters is the first theory of evolution, which was proposed by Jean Baptiste de Lamarck (1744-1829), a French biologist. Although the outline of the theory was brought to notice in 1801, his famous book "Philosophic Zoologique" was published in 1809, in which he discussed his theory in detail.
7. **(a)** nucleus of bud, bud, yeast, nucleus
   **Explanation:** This is the correct labeling.




8. **(d)** It dissociates completely in aqueous solution
   **Explanation:** Nitric acid is a mineral acid. It is a strong acid because it dissociates completely in aqueous solution to form hydronium ions.
9. **(c)** (A)
   **Explanation:** The flowers appear earlier in plant growing by vegetative propagation.
10. **(d)** All metal oxides react with water to give salt and acid.
    **Explanation:** Metal oxides are basic in nature. They give alkaline solution when dissolved in water.
11. **(b)** 1 : 1
    **Explanation:** When purebred tall plant with the phenotype (TT) crossed with a short plant with the phenotype (tt), the possible progeny in $F_2$ generation: TT(1), tt(1), and Tt(2). Thus the ratio of pure tall (TT) to pure short (tt) is 1:1.
12. **(a)** 1.603
    **Explanation:** According to Snell's law, the ratio of sine of angle of incidence to the sine of angle of refraction is equal to the constant for a given pair of media.
    Refractive index = $\frac{\text{(sine of angle of incidence)}}{\text{(sine of angle of refraction)}}$

Given,
Angle of incidence = 60 degree
Angle of refraction = 32.4 degree
Refractive index = $\frac{(\sin 60)}{(\sin 32.4)}$
Refractive index = 1.603

13. **(a)** $6.25 \times 10^{-18}$
**Explanation:** Given,
Charge moved = $1.6 \times 10^{-19}$ coulombs
Current, I = 1A
Time taken, t = 1s
We know that,
$I = \frac{Q}{t}$
$1 = \frac{Q}{1}$
Q = 1C
We also know that when the charge is $1.6 \times 10^{-19}$ coulombs, the number of electrons present is 1
Therefore, when a charge of 1 coulomb is present, the number of electrons is given as:
$\frac{(1)}{(1.6 \times 10^{-19})} = 0.625 \times 10^{-19} = 6.25 \times 10^{-18}$
14. **(c)** 1074 K
**Explanation:** The melting point of NaCl is $801^{o}$C or 1074 K.
15. **(a)** The nucleus first divides then cytoplasm
**Explanation:** In binary fission of Amoeba, the nucleus of the Amoeba first divides to form two daughter nuclei by the process of Karyokinesis. After the nucleus has divided into two, the process of Cytokinesis takes place in which the cytoplasm in the mother cell divides into two daughter cells. This leads to the formation of the two daughter Amoebae cell having a nucleus and its own cell organelles.
16. **(c)** Lenticels
**Explanation:** A lenticel is a porous tissue consisting of cells with large intercellular spaces in the bark of woody stems and roots. These raised pores in the stem of a woody plant that allows gas exchange between the atmosphere and the internal tissues.
17. **(a)** Both A and R are true and R is the correct explanation of A.
**Explanation:** Both A and R are true and R is the correct explanation of A.
18. **(b)** Both A and R are true but R is not the correct explanation of A.
**Explanation:** The nervous system is the system of conducting tissues that receive the stimulus and transmits it to other parts of the body forming a network of nerves. It is involved in receiving information (sensation) and generating responses to that information (motor response). The units which make up the nervous system are called nerve cells or neurons. Nerve impulses are always transmitted across a synapse from the axon terminals of one neuron to the dendrite/cell body of the next neuron.
19. **(d)** A is false but R is true.
**Explanation:** HCl (Hydrochloric) is a strong acid.
$HCl \rightleftharpoons H^{+} + Cl^{-}$
It donates proton in water.
20. **(a)** Both A and R are true and R is the correct explanation of A.
**Explanation:** Both A and R are true and R is the correct explanation of A.

## Section B

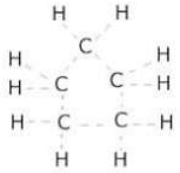
21. Spinal cord control the reflex action and carries information from body parts towards brain. In case of spinal cord injury, these action will not take place.
22. i. Covalent bond is formed by equal sharing of valence electrons between two atoms, hence there is no charge separation along the bond formed and they have weak intermolecular forces. Due to this, covalently bonded molecules have low melting and boiling points.
    ii. Unsaturated carbon compounds have double or triple bonds between carbon atoms, which are less stable than the sigma bonds and hence more reactive than saturated compounds which have single bond.

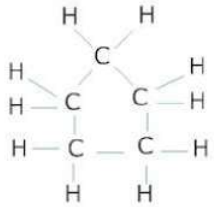
OR

i) Methanol ($CH_3OH$)

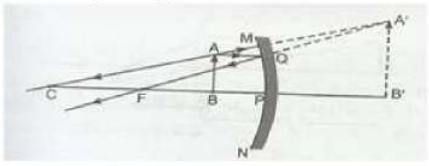
ii) Propan -1- ol ($CH_3$-$CH_2$-$CH_2$-OH)

23. All the interacting organisms in an area together with the non-living constituents of an environment form an Ecosystem. It has two components-
    (1) Abiotic components (non-living):- For example- air, water, soil, temperature, etc.
    (2) Biotic components (living):- For example- Plant, animals and micro-organisms.
24. Food chain is the process of food transfer from source in plants through a series of organisms with repeated eating and being eaten. At each transfer, a lot of energy is lost from food in the form of heat. Thus number of steps involved in any food chain is confined to four or five.
25. Cyclo-pentane is a cyclic compound with the formula $C_5H_{10}$ . The structure of the compound is represented as follows**:-**

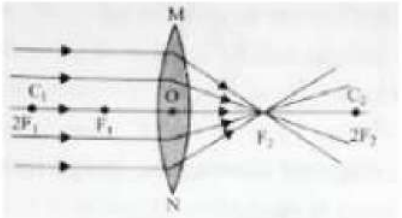




26. Object must be placed in front of concave mirror between its pole and principal focus at a distance less than 15 cm.
    The image formed will be virtual and erect. The size of the image is larger the object.
    The ray diagram is as follows:




OR




## Section C

27. We know that pencil appears to be bent at the interface of air and water because of refraction of light. The degree of refection depends on refractive index of a given liquid. Refraction indices of kerosene, water and other liquids would be different. Hence, degree of bend would be different in case of different liquids.

28. i. The substance whose solution in water is used for white washing is calcium oxide. Its formula is **CaO**.

ii. When quicklime is mixed with water, the following reaction takes place:

$$\underset{\substack{Calcium\\(QuickLime)}}{CaO(s)} + \underset{water}{H_2O(l)} \rightarrow \underset{\substack{Calcium\ hydroxide\\(Sleked\ lime)}}{Ca(OH)_2(aq)} + \text{Heat}$$

29. DNA copies generated will be similar, but may not be identical to the original as some variation are so drastic that new DNA copy cannot work with the cellular apparatus it inherits. Such a newborn cell will simply die. Therefore, there could be many other variations in the DNA copies that would not lead to such a drastic outcome. Thus, the surviving cells are similar but slightly different from each other. This tendency of variation during reproduction is the basis for evolution.

OR

i. In slice 1, no change will be observed or it will remain sterile because it lacks moisture, which is necessary for any organism to thrive.

ii. A white cottony mass surrounded with black pin head-like structures are seen spreading on the surface of slice 2. This is because tiny spores of Rhizopus present in air will thrive in humid conditions. Thus slice 2 kept in moist and dark place, develops sporangia and spores, which are favourable for the growth of fungus.

iii. In slice 3, also no change is observed (remains sterile) as it is kept at low temperature in the refrigerator. Which does not allow fungal growth. Moisture and warm conditions are necessary for fungal growth.

30. When we are in bright sunlight the aperture of the pupil would be small to regulate the amount of light entering the eye preventing glare, discomfort and damage to eyes. As we enter a dark room less amount of light would enter our eyes due to small size of pupil, and we won't be able to see objects clearly. It takes some time to regulate the size of the pupil through iris. Hence, it requires some time to see things.

31. a. Genotypes. Man ($I^A I^O$) Mother $I^B I^O$ and child $I^O I^O$.

b. Blood group of the future offspring. A type, B type, O type and AB type. It is based on the following cross:

| ♀ \ ♂ | $I^A$ | $I^O$ |
|---|---|---|
| $I^B$ | $I^AI^B$ | $I^BI^O$ |
| $I^O$ | $I^AI^O$ | $I^OI^O$ |

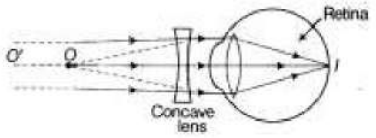
OR

In the male, half number of the sperms have X-chromosomes and the other half have Y-chromosome, i.e. (22 + X) and (22 + Y), both in equal numbers. But in females, all eggs have X chromosome only. Now, there are only two chances: sperm with X chromosome fusing with egg with X chromosome giving a baby girl (XX) or sperm with Y chromosome fusing with egg with X chromosome giving a baby boy (XY). Thus, making the statistical probability 50-50.

32. i. Near sightedness (myopia) defect arises either because of :
(a) decrease in focal length of eye lens.(b) elongation of the eye ball

ii. To correct this defect of vision, he must use a concave lens of suitable focal length. The concave lens of suitable focal length will bring the image back to the retina as

shown in the given figure.




iii. Given, v = -100 cm , u = $\infty$

Using lens formula,

$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \Rightarrow \frac{1}{-100} - \frac{1}{\infty} = \frac{1}{f}$

f = -100 cm = -1 m.

$\therefore$ Power of lens,

$P = \frac{1}{f(m)} = \frac{1}{-1}$ = -1D.

33. Aluminum is quite reactive, but the upper surface gets converted into its oxide called aluminum oxide ($AI_2O_3$) once it is kept in the air, and a thin coating is developed on the surface. This aluminium oxide is not reactive. Therefore, this metal is used for packing food articles which do not get spoiled in the foil.

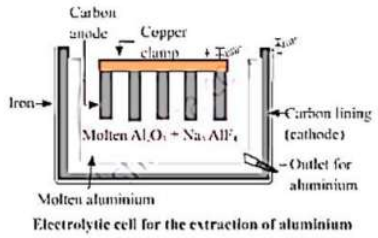
**Section D**

34. Oxides of sodium, magnesium and aluminium are very strong oxides as these metals are very reactive metals, but carbon is not a strong reducing agent and hence carbon cannot reduce the oxide of sodium, magnesium and aluminium to their respective metal.
In the reactivity series, sodium, magnesium and aluminium are placed in the upper portion and they are very reactive in nature and carbon is less reactive.
K > Na > Ca > Mg > Al > C > Zn > Fe
Oxides of reactive metals are directly put into the electrolytic reduction process to obtain the pure metal.
For the oxide of a reactive metal like aluminium oxide, as the metal is already in its oxide state so, it is directly put for the electrolytic reduction process. In this process, graphite electrodes are used as anode and cathode in the electrolytic chamber. Pure aluminium is attracted to the cathode, which is a lining of graphite. The oxygen is attracted to the anode and bubbles through the solution.
**Cathode reaction: A**t the cathode reduction of aluminium takes place and aluminium is discharged

$Al^{3+} + 3e^- \rightarrow Al$

**Anode reaction: A**t the anode oxidation takes place and oxygen gas is evolved.

$2O^{2-} \rightarrow O_2 + 4e^-$



Electrolytic cell for the extraction of aluminium

OR

a. When aluminium (Al) is placed in nitric acid ($HNO_3$), a layer of aluminium oxide is formed on the metal. This happens because nitric acid is a strong oxidizing agent. The layer of aluminium oxide prevents further reaction of aluminium. This is the reason why the reactivity of aluminium decreases.

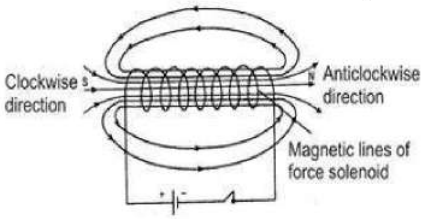
b. Sodium and magnesium have a tendency to react with oxygen rather than carbon because these are highly reactive metals. Hence, carbon cannot reduce the oxides of Na or Mg.

c. Ionic compounds do not conduct electricity in the solid-state but they conduct electricity in aqueous solution and in the molten state due to high concentration of free electrons. This property is shown by sodium chloride as it is an ionic compound.

d. Iron articles are galvanized to prevent them from rusting. After galvanization, the layer of zinc works as a protective layer. The most common type is hot-dip galvanizing. In this process, iron parts are submerged in a bath of molten zinc.

e. Metals such as Na, K, Ca and Mg are highly reactive metals and hence they are not found in their free state in nature.

35. A solenoid is a long circular coil containing a large number of close turns of insulated copper wire. When a electric current is passed through the solenoid, it produces magnetic field around it as shown in fig. Magnetic field produced by a current carrying solenoid is similar to the magnetic field produced by a bar magnet. As is clear from the figure, the lines enter from the left side and leave out from the right side. If we look from left side, the current appears to be passing in the coil in clockwise direction and hence it acts as a south pole according to clock rule. If the coil is viewed from right side, the current appears to be in anticlockwise direction. Hence, left-hand side face behaves as if this were a north pole. If the coil is left free, it will point South and North.
Since the current in the turns of the solenoid flows in the same direction, the magnetic field produced by each turn of the solenoid adds up, giving a very strong resultant field inside the solenoid. Hence, a solenoid may be used in making electromagnets.




Strength of the magnetic field produced depends upon the following three factors :
Number of turns: Large the number of turns, stronger will be the magnetic field produced.
Strength of the current in the solenoid: Larger the current, stronger will be the magnetic field produced.
Nature of core of solenoid: The strength of the field depends upon the core on which the coil is wound. For air core, field is very mild whereas for iron-core, the field is very strong.

36. The steps are:

i. Remove a healthy leaf from the potted plant.

ii. Remove a part of the peel from the lower surface of the leaf. The peel can be removed by folding the leaf over and gently pulling the peel-apart using forceps. Place the peel in a watch glass containing water.

iii. Add safranin to the watch glass to stain the peel lightly.

iv. After 2-3 minutes take out the and place is on a clean slide.

v. Put a drop of glycerine over the peel and place a clean coverslip gently over it with the help of a needle.

vi. Remove the excess stain and glycerine with the help of blotting paper.

vii. Observe the slide under the low-power and high-power magnifications of the compound microscope.

OR

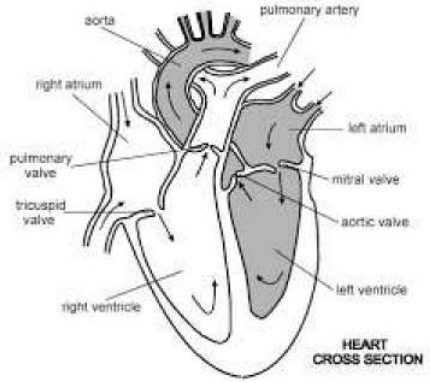
i. The oxygenated blood from the lungs comes back to the left atrium through a pair of the pulmonary vein.

ii. Aorta is the largest blood vessel in our body.

iii. The right atrium and left atrium separated by the atrial septum. The right and left ventricle separated by the ventricular septum.

iv. The pulmonary artery is the blood vessel that carries blood from the heart to the lungs

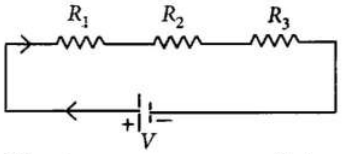
The sectional view of the human heart is as follows:




## Section E

37. **Read the text carefully and answer the questions:**

Two or more resistances are connected in series or in parallel or both, depending upon whether we want to increase or decrease the circuit resistance.




The two or more resistances are said to be connected in series if the current flowing through each resistor is the same.

(i) In series combination, $Rs = R_1 + R_2 + R_3 = R + R + R = 3R$.

(ii) The equivalent resistance is where the total resistance is connected either in parallel or in series.

Resistance of each wire = $\frac{20}{4} = 5\ \Omega$

Equivalent resistance in series

$R_S = 5 + 5 + 5 + 5 = 20\Omega$

OR

All are in series, $R_S = 5R = 5 \times 2 = 10\Omega$

38. **Read the text carefully and answer the questions:**

Salt of a strong acid and strong base is neutral with a pH value of 7. NaCl common salt is formed by a combination of hydrochloride and sodium hydroxide solution. This is the salt that is used in food. Some salt is called rock salt, bed of rock salt was formed when seas of bygone ages dried up. The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, and bleaching powder.

(i) Carbonic acid does not form an acidic salt.

(ii) Sodium bicarbonate, commonly known as baking soda or bicarbonate of soda, is a chemical compound with the formula $NaHCO_3$.

(iii) $Ca(OH)_2$ treatment with chlorine to obtain bleaching powder.

$$Ca(OH)_2 + Cl_2 \longrightarrow CaOCl_2 + H_2O$$

OR

Washing soda is used for removing the permanent hardness of the water.

39. **Read the text carefully and answer the questions:**

We have seen that the different parts of our body have specific functions. Our mouth waters when we see the food we like without our meaning to. Our heart's beat without our thinking about it. In fact, we cannot control these actions easily by thinking about them even if we wanted to. So, in between the simple reflex actions like change in the size of the pupil, and the thought out actions such as moving a chair, there is another set of muscle movements over which we do not have any thinking control. Many of these involuntary actions are controlled by the mid-brain and hind-brain. All these involuntary actions including blood pressure, salivation and vomiting are controlled by the medulla in the hind-brain. Think about activities like walking in a straight line, riding a bicycle, picking up a pencil. These are possible due to a part of the hind-brain called the cerebellum. It is responsible for the precision of voluntary actions and maintaining the posture and balance of the body. Imagine what would happen if each of these events failed to take place if we were not thinking about it.

(i) Reflex Action is an unconscious, automatic and involuntary response of efforts, i.e., muscles and glands, to a stimulus, which is monitored through the spinal cord. Reflex action is controlled by the spinal cord.

(ii) Yes, reflex action involves all parts of the voluntary nervous system.

(iii) The part of the autonomic nervous system that controls involuntary actions are controlled or regulated by medulla (hindbrain).

OR

'Beating of heart muscle' is an example of involuntary action. Involuntary actions are slower than reflex actions.