

SECTION-A

1. If you could use any source of energy for heating your food which one would you prefer? State one reason for your choice.
2. Write the function of voltmeter in an electric circuit.

SECTION-B

3. What happens to the image distance in the normal human eye when we decrease the distance of an object, say 10 m to 1 m? Justify your answer.
4. List two different functions performed by pancreas in our body.
5. How it can be proved that the basic structure of the Modern Periodic Table is based on the electronic configuration of atoms of different elements?

OR

The electronic configuration of an element is 2, 8, 4. State its :

- a. group and period in the Modern Periodic Table.
- b. name and write its one physical property.

SECTION-C

6. How can we help in reducing the problem of waste disposal? Suggest any three methods.

OR

Define an ecosystem. Draw a block diagram to show the flow of energy in an ecosystem.

7. List three advantages each of :
 - i. exploiting resources with short term aims, and
 - ii. using a long term perspective in managing our natural resources.
8. What is a rainbow? Draw a labelled diagram to show the formation of a rainbow.
9. Nervous and hormonal systems together perform the function of control and coordination in human beings. Justify this statement with the help of an example.

10. Trace the sequence of events which occur when a bright light is focused on your eyes.
11. What is photosynthesis? Explain its mechanism.
12. Name the plant Mendel used for his experiment. What type of progeny was obtained by Mendel in F_1 and F_2 generations when he crossed the tall and short plants? Write the ratio he obtained in F_2 generation plants.

OR

List two differences between acquired traits and inherited traits by giving an example of each.

13. 2 g of silver chloride is taken in a china dish and the china dish is placed in sunlight for sometime. What will be your observation in this case? Write the chemical reaction involved in the form of a balanced chemical equation. Identify the type of chemical reaction.

OR

Identify the type of reactions taking place in each of the following cases and write the balanced chemical equation for the reactions.

- a. Zinc reacts with silver nitrate to produce zinc nitrate and silver.
 - b. Potassium iodide reacts with lead nitrate to produce potassium nitrate and lead iodide.
14. Based on the group valency of elements write the molecular formula of the following compounds giving justification for each :
 - i. Oxide of first group elements.
 - ii. Halide of the elements of group thirteen, and
 - iii. Compound formed when an element, A of group 2 combines with an element, B of group seventeen
 15. Explain the following:
 - a. Sodium chloride is an ionic compound which does not conduct electricity in solid state whereas it does conduct electricity in molten state as well as in aqueous solution.
 - b. Reactivity of aluminium decreases if it is dipped in nitric acid.

- c. Metals like calcium and magnesium are never found in their free state in nature.

SECTION-D

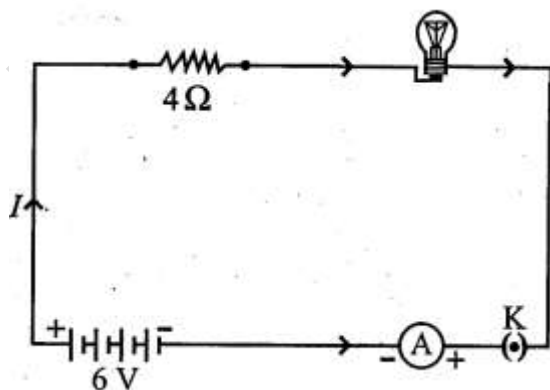
16.

- a. With the help of a suitable circuit diagram prove that the reciprocal of the equivalent resistance of a group of resistances joined in parallel is equal to the sum of the reciprocals of the individual resistances.
- b. In an electric circuit two resistors of $12\ \Omega$ each are joined in parallel to a $6\ \text{V}$ battery. Find the current drawn from the battery.

OR

An electric lamp of resistance $20\ \Omega$ and a conductor of resistance $4\ \Omega$ are connected to a $6\ \text{V}$ battery as shown in the circuit. Calculate :

- a. the total resistance of the circuit,
 b. the current through the circuit,
 c. the potential difference across the (i) electric lamp and (ii) conductor, and
 d. power of the lamp.



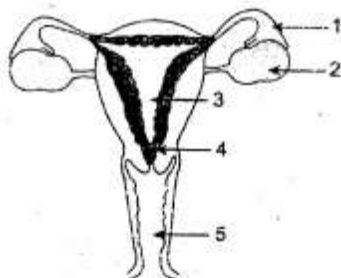
17.

- a. Draw magnetic field lines produced around a current carrying straight conductor passing through a cardboard. Name, state and apply the rule to mark the direction of these field lines.
- b. How will the strength of the magnetic field change when the point where magnetic field is to be determined is moved away from the straight wire carrying constant Current? Justify your answer.

18. An object is placed at a distance of 60 cm from a concave lens of focal length 30 cm.
- Use lens formula to find the distance of the image from the lens.
 - List four characteristics of the image (nature, position, size, erect/inverted) formed by the lens in this case.
 - Draw ray diagram to justify your answer of part (ii).
19. Define pollination. Explain the different types of pollination. List two agents of pollination? How does suitable pollination lead to fertilization?

OR

- a. Identify the given diagram, Name the parts 1 to 5.



- b. What is contraception? List three advantages of adopting contraceptive measures.
20. Write the chemical formula and name of the compound which is the active ingredient of all alcoholic drinks. List its two uses. Write chemical equation and name of the product formed when this compound reacts with -
- sodium metal
 - hot concentrated sulphuric acid

OR

21. What is methane? Draw its electron dot structure. Name the type of bonds formed in this compound. Why are such compounds?
- Poor conductors of electricity and
 - Have low melting and boiling points? What happens when this compound burns in oxygen?

22. Write the main difference between an acid and a base. With the help of suitable examples explain the term neutralization and the formation of -
- acidic,
 - basic and
 - neutral salts.

SECTION-E

23. In the experimental set up to show that "CO₂ is given out during respiration", name the substance taken in the small test tube kept in the conical flask. State its function and the consequence of its use.
24. A student is observing the temporary, mount of a leaf peel under a microscope. Draw labelled diagram of the structure of stomata as seen under the microscope.

OR

Draw a labelled diagram in proper sequence to show budding in hydra.

25. List four precautions which a student should observe while determining the focal length of the given convex lens by obtaining image of a distant object on a screen.
26. While studying the dependence of potential difference (V) across a resistor on the current (I) passing through it, in order to determine the resistance of the resistor, a student took 5 readings for different values of current and plotted a graph between V and I. He got a straight line graph passing through the origin. What does the straight line signify? Write the method of determining resistance of the resistor using this graph.

OR

What would you suggest to a student if while performing an experiment he finds that the pointer/needle of the ammeter and voltmeter do not coincide with the zero marks on the scales when circuit is open? No extra ammeter/voltmeter is available in the laboratory.

27. In three test tubes A, B, and C, three different liquids namely, distilled water, underground water and distilled water in which a pinch of

calcium sulphate is dissolved, respectively are taken. Equal amount of soap solution is added to each test tube and the contents are shaken. In which test tube will the length of the foam (lather) be longest? Justify your answer.

28. Blue litmus solution is added to two test tubes A and B containing dilute HCl and NaOH solution respectively. In which test tube a colour change will be observed? State the colour change and give its reason.

OR

What is observed when 2 mL of dilute hydrochloric acid is added to 1 g of sodium carbonate taken in a clean and dry test tube? Write chemical equation for the reaction involved.

CBSE Question Paper 2019 (Set-1)
Class 10 Science

Answer

1.
 - a. Fuel energy / microwave / hot plate / solar energy
 - b. Easily available
2. To measure potential difference across two points.
3.
 - a. To measure potential difference across two points.
 - b. It is the distance between the eye lens and retina, which remains the same.
4.
 - a. Pancreas act as a gland by secreting pancreatic juice which contains enzymes.
 - b. Secretes hormones like insulin/glucagon.
5. Modern periodic table consists of groups and periods. Where number of valence electrons determines the group and number of shells determines the period.

OR

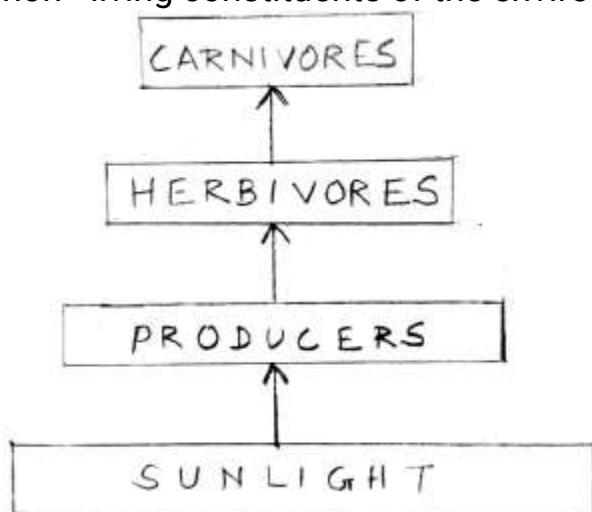
- i. Group - 14, Period - 3

- ii. Silicon
Non - metallic/poor conductor of electricity

6. Segregation of waste; Recycling; Composting: Reducing the use of non - biodegradable material: Reuse

OR

The system where all the living organisms in an area together interact with the non - living constituents of the environment.



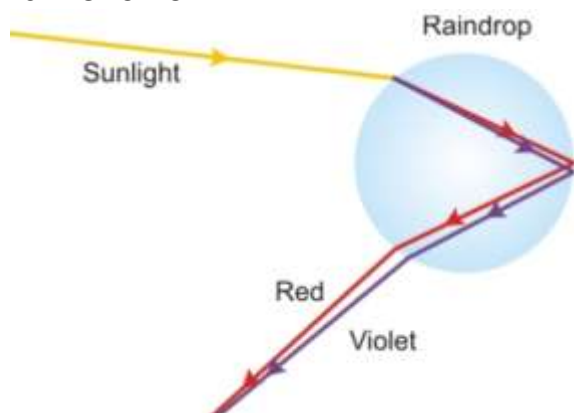
7. Three advantages of exploiting resources with short term aims:

- i. Immediate benefit to few people.
- ii. Progress in science and technology for development in a country.
- iii. Urbanisation and Industrialisation of an area.

Three advantages of using a long time perspective:

- i. Resources will be made available for sustainable development.
- ii. Provides valuable contribution to the socio-economic development.
- iii. Quality of environment will be conserved.

8. Rainbow - A natural spectrum of sunlight appearing in the sky after a rain shower



9. For nervous and hormonal systems to control and coordinate in human beings, hypothalamus plays an important role in receiving the neural / nerve signals from brain and release hormones.
Ex - In situation of iodine deficiency, hypothalamus releases hormones to stimulate pituitary gland, it further sends stimulating hormone to thyroid gland to secrete thyroxine that regulates carbohydrate metabolism.
10. Receptor Cells of eyes/retina → Sensory Neuron → Brain/CNS → Motor Neuron → Eye Muscles → Pupil contracts/Eye lids close/blink
(Note: If a child writes spinal cord in place of brain give full credit to him/her)
11. A process in which green plants takes carbon dioxide and water and convert them into carbohydrates / food in the presence of sunlight and chlorophyll.
Mechanism:
- Absorption of high energy by chlorophyll.
 - Conversion of high energy to chemical energy.
 - Splitting of water molecules into hydrogen and oxygen.
 - Reduction of carbon dioxide to carbohydrate.
- 12.
- Pea Plant / Garden pea / Pisum sativum
 - F₁ - All tall; F₂ - Tall and short

- Ratio - Tall: Short
3:1/1:2:1

OR

Acquired Traits	Inherited Traits
These traits are not transferred from one generations to the next generation.	These traits are transferred from one generation to the next.
They do not bring about change in DNA. Example: Acquiring any skill.	They bring about changes in DNA. Example: Eye colour

13.

- While silver chloride turns grey in sunlight.
- $2\text{AgCl} \xrightarrow{\text{Sunlight}} 2\text{Ag} + \text{Cl}_2$
- Decomposition reaction / Photolytic decomposition.

OR

- Displacement reaction
 $\text{Zn} + 2\text{AgNO}_3 \rightarrow \text{Zn}(\text{NO}_3)_2 + 2\text{Ag}$
- Double displacement reaction
 $2\text{KI} + \text{Pb}(\text{NO}_3)_2 \rightarrow \text{PbI}_2 + 2\text{KNO}_3$ (deduct 1/2 mark for non balanced equation).

14.

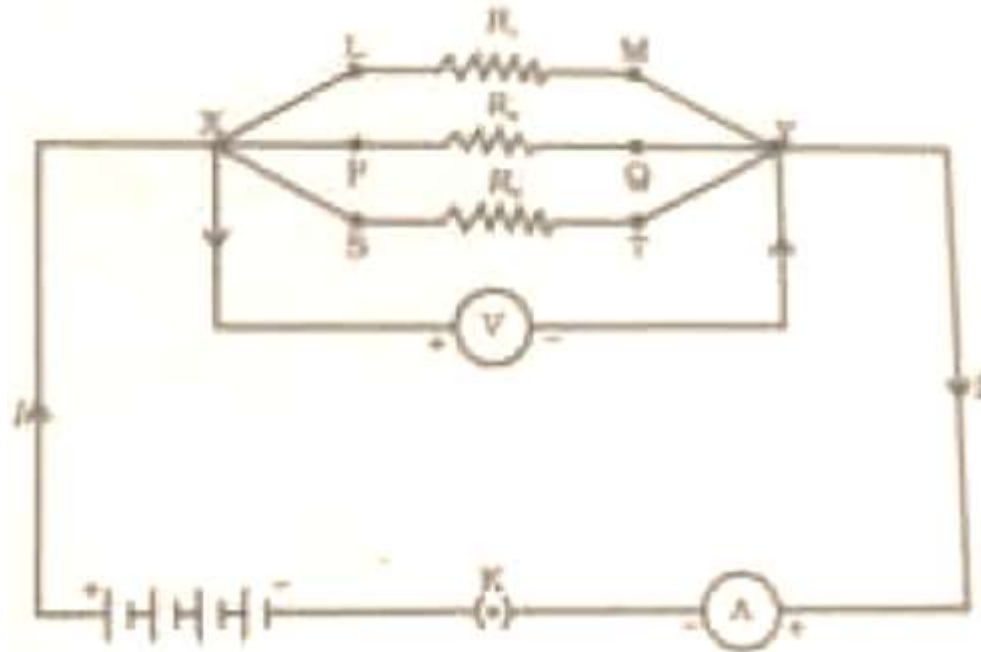
- A_2O - Valency of group one is 1 and of oxygen is 2
- AX_3 - Valency of group 13 is 3 and of halogen is 1
- AB_2 - Valency of element A of group 2 is 2 and of element B of group seventeen is 1.

15.

- In molten state, due to heat the electrostatic forces of attraction between the oppositely charged ions are overcome. So ions move freely and conduct electricity.
In aqueous solutions ions are free and conduct electricity.
- Due to the formation of a coating of aluminium oxide / Al_2O_3 .
- Reactive metals like calcium and magnesium react easily with different elements and occur in the form of ores.

16.

a.



From figure:

$$I = I_1 + I_2 + I_3$$

$$I_1 = \frac{V}{R_1}, I_2 = \frac{V}{R_2}, I_3 = \frac{V}{R_3}$$

$$\therefore V_{RP} = V_{R_1} + V_{R_2} + V_{R_3} \quad V_{RP} = V_{R_1} + V_{R_2} + V_{R_3}$$

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

b. $R_1 = R_2 = 12 \Omega$ $V = 6V$

$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{12} + \frac{1}{12} \quad \frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{12} + \frac{1}{12}$$

$$\therefore R_p = 6 \Omega$$

$$I = \frac{V}{R_p} = \frac{6V}{6\Omega} \quad \frac{V}{R_p} = \frac{6V}{6\Omega} = 1A$$

OR

a. $R = R_1 + R_2$
 $= 20 \Omega + 4 \Omega = 24 \Omega$

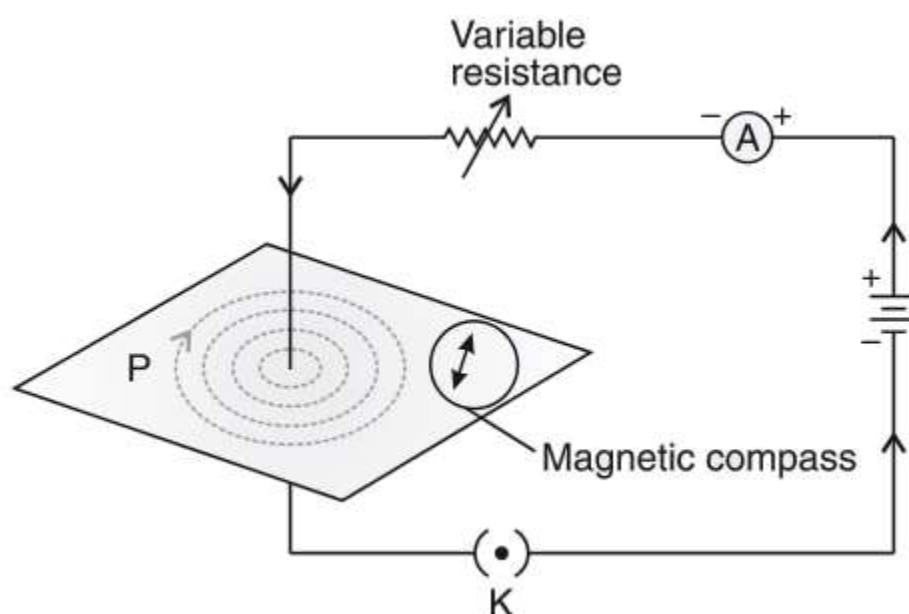
b. $I = \frac{V}{R}$
 $= \frac{6V}{24\Omega} = \frac{6V}{24\Omega} = 0.25 A$

c.

- i. For electric lamp:
 $V = IR$
 $= 624 \times 20 = 12480 \text{ V}$
- ii. For Conductor:
 $V = IR$
 $= 624 \times 4 = 2496 \text{ V}$
- d. $P = VI$
 $= 5 \text{ V} \times 625 \times 625 \text{ A} = 1.25 \text{ W}$

17.

a.



- Rule - Right hand thumb rule
 Imagine that you are holding a current-carrying straight conductor in your right hand such that the thumb points towards the direction of current. Then your fingers will wrap around the conductor in the direction of the field lines of the magnetic field.
- Strength decreases
- Reason - the concentric circles representing the magnetic field around a current-carrying straight wire become larger and longer as the distance increases.

18.

i. $u = -60 \text{ cm}, f = -30, v = ?$

$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} \quad \frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$\therefore \frac{1}{v} = \frac{1}{f} + \frac{1}{u} \quad \therefore \frac{1}{v} = \frac{1}{f} + \frac{1}{u}$$

$$= \frac{1}{-30 \text{ cm}} + \frac{1}{-60 \text{ cm}} = -\frac{3}{360} = \frac{1}{-120 \text{ cm}} = \frac{1}{-360}$$

$$\therefore V = -20 \text{ cm}$$

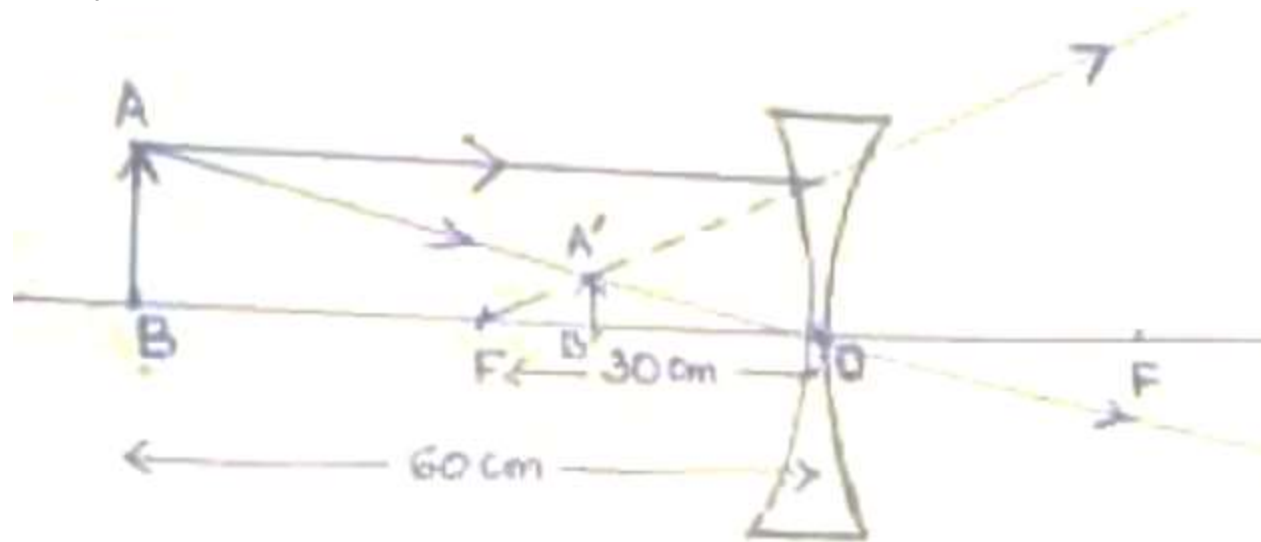
$$m = \frac{v}{u} = \frac{-20 \text{ cm}}{-60 \text{ cm}} = \frac{1}{3} = 0.33$$

ii. Nature:- Virtual

Position:- 20 cm from lens on the same side as the object

Size:- Diminished

Erect/Inverted:- Erect



iii.

19.

- Pollination – Transfer of pollen from anther / stamen to stigma of the flower.
- Type of Pollination -
 - a. Self pollination - Transfer of pollen from anther/stamen to stigma occurs in the same flower.
 - b. Cross pollination - Pollen is transferred from anther/stamen of one flower to stigma of another flower.
- Agents of pollination – Wind, Water, Insects and Animals.
- A tube grows out of the pollen grain and travels through the style, to reach the female germ cell in the ovary to cause fertilization.

OR

- Female reproductive system

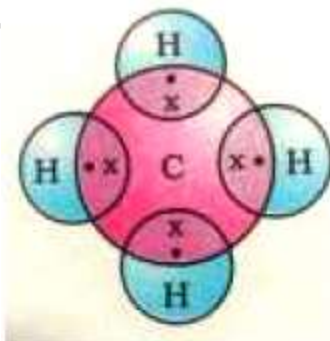
- Name of parts -
 - i. Fallopian tube/Oviduct
 - ii. Ovary
 - iii. Uterus
 - iv. Cervix
 - v. Vagina
- Method to avoid pregnancy
- Advantages
 - Proper gap between two pregnancies
 - Avoiding unwanted pregnancy
 - Keeping population under control

20.

- a. C_2H_5OH , Ethanol/Ethyl alcohol
- b. Good solvent; used in medicines
 - i. $2C_2H_5OH \rightarrow 2C_2H_5ONa + H_2$
Sodium ethoxide
 - ii. $C_2H_5OH \xrightarrow{Hot Conc. H_2SO_4} CH_2=CH_2 + H_2O$
Ethene

OR

- CH_4 /Simplest hydrocarbon



- Covalent bonds
 - i. No ions or charged particles are formed
 - ii. Due to weak covalent bonds
 - Carbon dioxide and water are produced/
 $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

21.

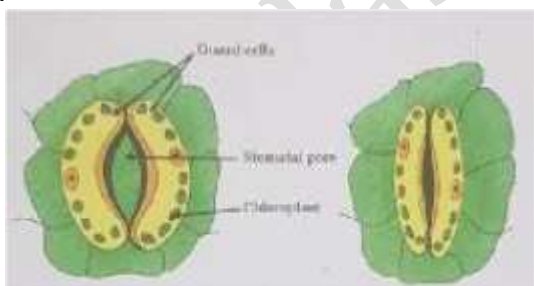
Acid	Base
An acid produces H ⁺ ions in aqueous solution	A base produces OH ⁻ ions in aqueous solution.
Acids are sour in taste.	Bases are bitter in taste
Acids change the colour of blue litmus to red.	Bases change the colour of red litmus to blue.

- Neutralization - A reaction of an acid with a base to produce salt and water.
 - Acidic - $\text{Na}_4\text{OH} + \text{HCl} \rightarrow \text{NH}_4\text{Cl} + \text{H}_2\text{O}$
 - Basic - $\text{NaOH} + \text{H}_2\text{CO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{H}_2\text{O}$
 - Neutral - $\text{KOH} + \text{HNO}_3 \rightarrow \text{KNO}_3 + \text{H}_2\text{O}$

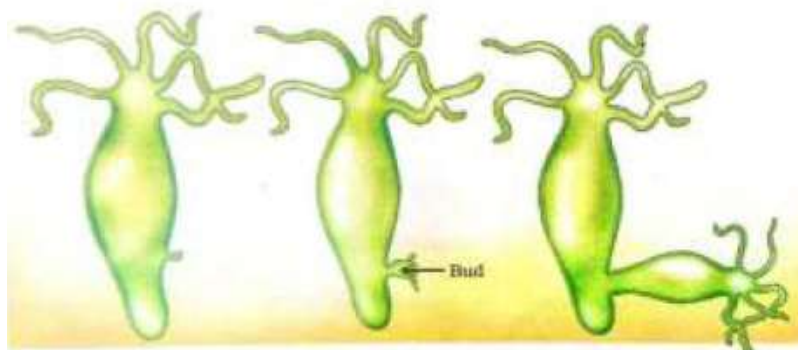
22.

- Substance taken: KOH
- Function: It absorbs CO₂ produced by the germinating seeds
Consequence: The water level rises in the test tube dipped in the beaker/partial vacuum is created.

23.



OR



- Drawing in proper sequence
Labelling-Bud
24. Precautions:
- i. Lens should be held in vertical position with its faces parallel to the screen.
 - ii. Clear and sharpest image should be obtained by adjusting the position of lens.
 - iii. Three observations should be taken at least.
 - iv. Base of lens, screen and measuring scale should be in straight line.
- 25.
- Potential difference (V) is directly proportional to current (I) or $V \propto I$
 - Method: Finding slope of the graph.
- OR**
- Measure the zero error.
 - Value of zero error should be adjusted to the observed values
- 26.
- a. In test tube A
 - b. As distilled water contains no salts
- 27.
- a. Test Tube A
 - b. It changes the colour from blue to red
Hydrochloric acid turns blue litmus red.
- OR**
- c. Brisk effervescence is produced
 - d. $\text{Na}_2\text{CO}_3 + 2\text{HCl} \rightarrow 2\text{NaCl} + \text{H}_2\text{O} + \text{CO}_2$.