Science

Time: 3 Hours **Max. Marks: 80**

S. No.	Typology of Question	Very Short Answer (VSA) 1 Mark	Short Answer– I (SA I) 2 Marks	Short Answer– II (SA II) 2 Marks	Long Answer (LA) 5 Marks	Total Marks	% Weightage
1.	**Remembering**	2	-	1	1	10	15%
2.	**Understanding**	-	1	4	2	24	35%
3.	**Application**	-	1	2	2	18	26%
4.	**High Order Thinking Skills**	-	-	1	1	8	12%
5.	**Inferential and Evaluative**	-	1	1 + 1**	-	8	12%
	Total (Theory Based Questions)	2 × 1 = 2	3 × 2 = 6	10 × 3 = 30	6 × 5 = 30	68(21)	100%
	Practical Based Questions		6 × 2 = 12	-	-	12(6)	
	Total	2 × 1 = 2	9 × 2 = 18	10 × 3 = 30	6 × 5 = 30	80(27)	

1. Question paper will consist of 27 questions

2. All questions would be compulsory. However, an internal choice will be provided in two questions of 3 marks each and one question of 5 marks.

** One Question of 3 marks will be included to assess the values inherent in the texts.

SECTION- A

Q1. Why is anaerobic respiration less efficient?

Q2. Name the components of neuron.

Q3. Choose from the following:

$_{6}C$, $_{8}O$, $_{10}Ne$, $_{11}Na$, $_{14}Si$

(i) elements that should be in the same period.

(ii) elements that should be in the same group.

State reason for your selection in each case.

Q4. An object of size 7.0 cm is placed at 27 cm in front of a concave mirror of focal length 18 cm. At what distance from the mirror should a screen be placed, so that a sharp focussed image can be obtained? Find the magnification of the image.

Q5. Why must we conserve our forests? List any two causes for deforestation taking place.

Q6. How does a solenoid behave like a magnet? Can you determine the north and south poles of a current carrying solenoid with the help of a bar magnet? Explain.

OR

Why does a magnetic compass needle pointing North and South in the absence of a nearby magnet deflected when a bar magnet or a current carrying loop is brought near it? Describe some salient features magnetic lines of field concept.

Q7. A current of 1 ampere flows in a series circuit containing an electric lamp and a resistor of resistance 5 Ω when connected to a 10 V battery. Calculate the resistance of the electric lamp. Now if a resistor of resistance 10 Ω is connected in parallel with this series combination, what change (if any) in current flowing through 5 Ω resistor and potential difference across the lamp will take place? Give reason.

Q8. Write the balanced chemical equations for the following reactions:

(i) Hydrogen + Chlorine → Hydrogen chloride

(ii) Magnesium oxide + Carbon → Magnesium + Carbon monoxide

(iii) Sodium + Water → Sodium hydroxide + Hydrogen

Q9. (a) Arrange the following elements in increasing order of their atomic radii:

Li, Be, F, N

Give reason.

(b) Compare the radii of two species X and Y. Give reasons for your answer.

(i) X has 12 protons and 12 electrons (ii) Y has 12 protons and 10 electrons

Q10. Describe the mechanism of blood clotting.

OR

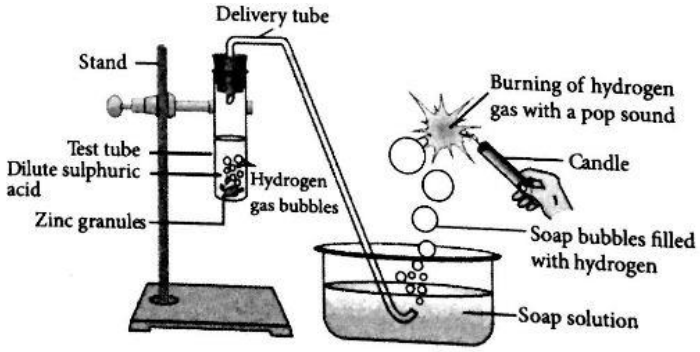
What are the differences between autotrophic nutrition and heterotrophic nutrition?

Q11. Explain analogous organs and homologous organs. Identify the analogous and homologous organs amongst the following:

Wings of an insect, wings of a bat, forelimbs of frog, forelimbs of a human.

Q12. Size of image of an object by a mirror having a focal length of 20 cm is observed to be reduced to (1/3rd) of its size. At what distance the object has been placed from the mirror? What is the nature of the image and the mirror?

Q13. In the following schematic diagram for the preparation of hydrogen gas as shown in the given figure, what would happen if following changes are made?



(a) In place of zinc granules, same amount of zinc dust is taken in the test tube.

(b) Instead of dilute Sulphuric acid, dilute hydrochloric acid is taken.

(c) In place of zinc, copper turnings are taken.

OR

(a) You have two solutions, A and B. The pl of solution A is 6 and pH of solution B is 8. Which solution has more hydrogen ion concentration? Which of this is acidic and which one is basic?

(b) What effect does the concentration of H+(aq) ions have on the nature of the solution?

Q14. What is the importance of hydropower plants in India? Describe how electric energy is generated in such plants.

Q15. Last Sunday I went to the park and I saw some children playing there. While playing one of the child fell down and got severe head injury. He was bleeding very badly. His friends started crying and then the guard came. He took the child to the nearby hospital, where he was given blood.

(a) What values were shown by the guard?

(b) What part of the blood plays a role in preventing excessive bleeding?

(c) Which enzyme helps in coagulation of blood?

Q16. Briefly explain an activity to plot the magnetic field lines around a bar magnet. Sketch the field pattern for the same specifying field directions.

A region A has magnetic field lines relatively closer than another region B. Which region has stronger magnetic field. Give reason to support your answer.

Q17. (a) In a tabular form, differentiate between ethanol and ethanoic acid under the following heads:

(i) physical state
(ii) taste
(iii) $NaHCO_3$ test
(iv) ester test

(b) Write a chemical reaction to show the dehydration of ethanol.

OR

(a) With the help of a suitable example, explain the process of hydrogenation mentioning the conditions of the reaction and any one change in physical property with the formation of the product.

(b)How does a saturated hydrocarbon react with chlorine? Write chemical equation for it. What type of reaction is it called and why?

Q18. (a) Draw the structure of a neuron and label the following on it: nucleus, dendrite, cell body and axon.

(b) Name the part of neuron:

(i) Where information is acquired.
(ii) Through which information travels as an electrical impulse.

Q19. Write of refraction. Explain the same with the help of ray diagram, when a ray of light passes through rectangular glass slab.

Q20. (i) Distinguish between ionic and covalent compounds under the following properties:

(a) strength of forces between constituent elements
(b) solubility of compounds in water
(c) electrical conduction in substances

(ii) Explain how the following metals are obtained from their compounds by the reduction process:

(a) metal 'M' which is in the middle of the reactivity series.
(b) metal 'N' which is high up in the reactivity series.

Give one example of each type.

Q21. (a)Suggest any three activities in daily life which are eco-friendly.

(b) Give one example each from your daily life where the domestic waste can be effectively reused and recycled.

OR

What is sustainable development? Explain it with respect to forest, wildlife and water resources.

SECTION – B

Q22. What happens when barium chloride solution and sodium sulphate solution are mixed together? Write the chemical equation involved.

Q23. What do you observe when you drop a few drops of acetic acid to a test tube containing

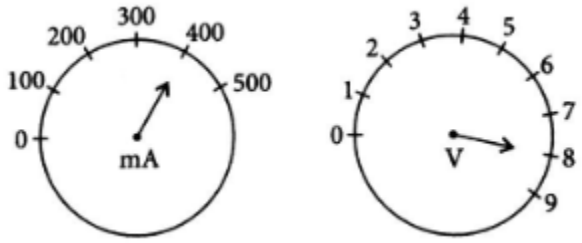
(a) phenolphthalein (b) distilled water (c) universal indicator.

OR

A student is studying the properties of acetic acid. List two physical properties of acetic acid, he What happens when he adds a pinch of sodium hydrogen carbonate to this acid? Write any two observations.

Q24. A 4 cm tall object is placed on the principal axis of a convex lens. The distance of the object from the optical centre of the lens is 12 cm and its sharp image is formed at a distance of 24 cm from it on a screen on the other side of the lens. If the object is now moved a little away from the, lens, in which direction (towards the lens or away from the lens) will he have the screen to het a sharp image of the object on it again? How will the magnification and intensity of the image be affected?

Q25. The reading of current flowing thorough a conductor and the potential difference across its two ends are shown in the milliammeter and voltmeter given below. Note these readings and determine the conductor.



Q26. Are bonary fission and budding faster process of reproduction when compared to sexual reproduction?

Q27. State economics importance of yeast.

SOLUTION

Ans 1. Anaerobic respiration is the incomplete breakdown of glucose and produces less energy, so it is less efficient.

Ans 2. Dendrite, cell body, axon and nerve ending.

Ans 3. The electronic configurations of the given elements are:

		K	L	M
$_{6}C$	:	2,	4	
$_{8}O$	:	2,	6	
$_{10}Ne$	:	2,	8	
$_{11}Na$	:	2,	8,	1
$_{14}Si$	:	2,	8,	4

(i) $_{6}C$, $_{8}O$, $_{10}Ne$, all contain two shells hence, they belong to the same period i.e., second period.

$_{11}Na$, $_{14}Si$ both contain three shells hence, they belong to third period.

(ii) $_{6}C$and $_{14}Si$ belong to the same group (*i.e,* group 14) as they both contain 4 electrons in their outermost shell.

Ans 4. For concave mirror, u - -27 cm, h^1 = 7.0 cm, f = -18 cm, h_1 = 7.0 cm

Using mirror formula, $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$$\frac{1}{v} + \frac{1}{(-27)} = \frac{1}{(-18)}$$

$$\frac{1}{v} = \frac{-1}{18} + \frac{1}{27} = \frac{-3+2}{54} = \frac{-1}{54}$$

$$\therefore \quad v = -54 \text{ cm}$$

Screen is placed at 54 cm in front of the mirror.

$$\therefore \quad m = \frac{-v}{u} = \frac{-(-54)}{-27} = -2$$

Ans 5. We must conserve our forest as they are very useful.

(i) It conserves soil by preventing soil erosion, prevents flood and holds lot of water, maintain ground level of water and brings rainfall.

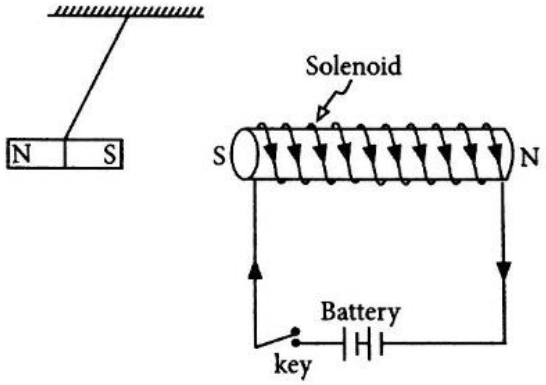
(ii) It provides lot of raw material for many industries like timber, sal, wood, bidi and tendu leaves, coir, etc.

Two causes of deforestation are:

(i) Exploitation by industries
(ii) Due to increase in population, lot of forest is converted to barren land to build roads and dams for the infrastructure development. Pressure of human settlement is also a major cause.

Ans 6. Long cylindrical coil consisting of a large number of turns of an insulated wire is called a solenoid. When current is passed through a solenoid, it acts as a bar magnet. Suspend a bar magnet from a support. Bring a current-carrying solenoid near the north pole of the bar magnet. Observe it will get attracted or repelled Now, bring the same end of the solenoid near the south pole of the bar magnet. Observe it will get attracted or repelled. You will find, one of the poles of the bar magnet getting attracted, and the other repelled.

Following the rule that opposite poles attract each other, one can identify the poles of the solenoid. In the shown diagram bar magnet is repelled.



OR

In the absence of a bar magnet, a magnetic compass needle pointing north and south is acted upon by earth's field only. But when a bar magnet is placed near the magnetic compass, magnetic field near the compass gets modified and needle get deflected from north and south.

Some silent features of magnetic lines of field.

(i) The magnetic lines of force emerge from the north pole and following a curved path, enter the south pole and reach back the north pole moving inside the magnet. Thus these are closed curves.

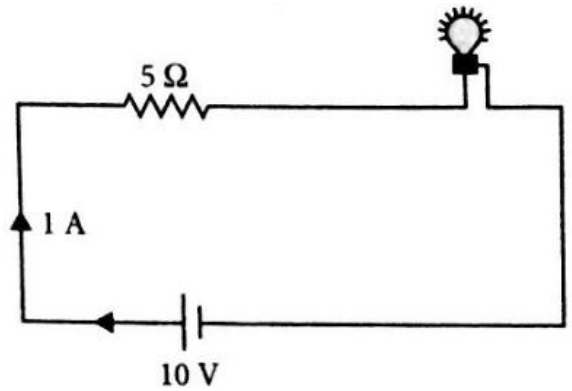
(ii) Two lines of force never intersect each other If they ever did so, there would be two tangents at the point of intersection, that is, two directions of magnetic field at one point, which is impossible.

(iii) Near the magnetic poles, where the field is stronger, the lines of force are closer. Going away from the poles, the field becomes weaker and the lines become rarer. Thus, larger the numbers of lines of force per unit area at a given point, stronger is the magnetic field at that point.

Ans 7. Let the resistance of electric lamp be $R_l\Omega$.

∴ Net resistance of the circuit, $R = (R_l + 5)\ \Omega$

Now, current in the circuit,



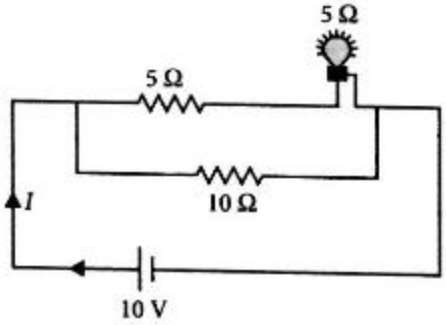
$$I = \frac{V}{R} = \frac{10}{R_l + 5}\ \text{A}$$

But $I = 1$ A (given)

$$\therefore \quad \frac{10}{R_l + 5} = 1$$

or $R_l = 10 - 5 = 5\ \Omega$

Now, modified circuit is



Net resistance of the circuit $= \frac{10 \times 10}{10 + 10} = 5\ \Omega$

So, current in the circuit $= \frac{10}{5} = 2$ A

Now this current divides in parallel combination of equal resistances. Therefore current through $5\ \Omega$ resistor and lamp in series,

$$\mathrm{I}' = \frac{2\mathrm{A}}{2} = 1\mathrm{A}$$

Now, potential difference across the lamp

$$= 1\ \mathrm{A} \times 5\ \Omega = 5\ \mathrm{V}$$

Therefore, there is no change in current flowing through the conductor and potential across the lamp.

Ans 8.

(i) $H_{2(g)} + Cl_{2(g)} \longrightarrow 2HCl_{(g)}$

Hydrogen Chlorine Hydrogen chloride

(ii) $MgO_{(s)} + C_{(s)} \longrightarrow Mg_{(s)} + CO_{(g)}$

Magnesium oxide Carbon Magnesium Carbon monoxide

(iii) $2Na_{(s)} + 2H_2O_{(l)} \longrightarrow 2NaOH_{(aq)} + H_{2(g)}$

Sodium Water Sodium hydroxide Hydrogen

Ans 9. (a) F < N < Be < Li

As we move across the period from Li to F, atomic radii decreases.

(b) (i) X = 12 protons and 12 electrons (or 2, 8, 2)

(ii) Y = 12 protons and 10 electrons (or 2, 8)

Radius of X > Y as radius of cation is always less than that of the atom. Y is cation of X formed by losing 2 electrons or one shell.

$$X - 2e^- \longrightarrow Y$$

K, L, M K, L

$(2, 8, 2)$ $(2, 8)$

Ans 10. Blood clotting prevents the loss of blood at the site of an injury or wound by forming a 'blood clot' The blood has platelet cells which circulate around the body and plug these leaks by helping to clot the blood at these points of injury to prevent it from excessive bleeding.

OR

Autotrophic nutrition implies that the organism prepares its own food and is not dependent on any other organism for its food. All green plants are autotrophs.

Heterotrophic nutrition implies that the organism is not able to prepare its own food and is dependent on other organisms for its food. All organisms which are not included in the category of green plants are heterotrophic.

Ans 11. Analogous organs are those organs which have different structural designs and origin but perform similar functions. Homologous organs are those which have the same basic structural design and origin but perform different functions.

Analogous organs : Wings of an insect, wings of a bat.
Homologous organs : Forelimbs of a frog, forelimbs a human.

Ans 12. Case (i) : Let the mirror be a convex mirror.

$f = 20\ cm, m = 1/3$

Now, $m = -\frac{v}{u}; \frac{1}{3} = \frac{-v}{u} \Rightarrow v = \frac{-u}{3}$

Using mirror formula, $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$-\frac{3}{u} + \frac{1}{u} = \frac{1}{20}$ or $\frac{-2}{u} = \frac{1}{20}$ or $u = -40\ cm$

The object is placed at 40 cm from the convex mirror.

Nature of image is virtual and erect.

Case (ii): Let the mirror be a concave mirror.

$f = -20$ cm, $m = -1/3$

Now, $m = -\frac{v}{u}; -\frac{1}{3} = -\frac{v}{u}, \Rightarrow v = \frac{u}{3}$

Using mirror formula, $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

$\frac{3}{u} + \frac{1}{u} = \frac{-1}{20}$ or $\frac{4}{u} = \frac{-1}{20}$ or $u = -80$ cm

The object is placed at 80 cm from the concave mirroir. Nature of image is real and inverted.

Ans 13. (a) If zinc dust is taken in place of zinc granules, hydrogen gas will come out with greater speed. This is because of larger surface area of zinc dust as compared to zinc granules.

(b) If dilute hydrochloric acid is taken instead of sulphuric acid, same amount of gas will come out.

(c) If copper turnings are taken in place of zinc, H_2 gas is not evolved since Cu being less reactive than H does not displace hydrogen from Sulphuric acid.

OR

(a) pH of solution A = 6

$\therefore$ H^+ ion concentration = 10^{-6} M

pH of solution B = 8

$\therefore$ H^+ ion concentration = 10^{-8} M

As $10^{-6} > 10^{-8}$, hence splution A has more H^+ ion concentration.

A solution with pH < 7 is acidic. Hence, solution A is acidic.

A solution with pH > 7 is basic. Hence, solution B is basic.

(b) If a solution has higher concentration of H^+ ions it is more acidic in nature.

Ans 14. Hydropower plants are of prime importance as about 25 percent of our energy requirement in India is met by hydropower plants.

(i) A high-rise dam is constructed at a suitable place on the river to obstruct the flow of water and thereby, collect water in larger reservoirs. Due to rise in water level the kinetic energy of flowing water is transformed into potential energy of stored water.

(iI) The water from the high level in the dam is carried through sluice gates and pipes to the turbine of electric generator, which is fitted at the bottom of the dam.

Due to flowing water, turbine is rotated at a fast rate and hydroelectricity is produced.

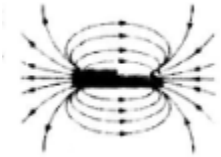
(ii) A hydropower plant converts the potential energy of falling/stored water into electricity.

Ans 15. (a) The values shown by the guard are truthfulness to duty, humanity, care and responsibility.

(b) Blood platelets play an important role in preventing excessive bleeding.

(c) At the site of injury, blood platelets release an enzyme, thromboplastin that causes coagulation of blood to prevent excessive bleeding

Ans 16. Various steps are taken to plot the magnetic field lines around a bar magnet:



(i) Take a drawing sheet and fix it on a smooth table with adhesive tape.

(ii) Place a bar magnet in the middle of the drawing sheet and drawing its boundary with a sharp pencil.

(iii) Place a magnetic compass near one end of the magnet (N-pole) and mark the positions of the two ends (N and S-poles) of the compass needle using a sharp pencil.

(iv) Shift the compass from this position and place it in such a way that S-pole of its needle is one the point you marked in previous step for N-pole.

(v) Again mark the position of the other end (N-pole) of the compass needle.

(vi) Repeat the steps (iv) and (v), till you reach the other end (S-pole) of the bar magnet.

(vii) Join all the points with a sharp pencil to get a smooth curve.

(vii) Put the compass at some other points near the N-pole of the magnet and draw another magnetic field lines. Similarly, draw many field lines on both the sides of the bar magnet as shown in figure.

(ix) Observe the pattern of the magnetic field lines Result: Magnetic field lines can be drawn around a bar magnet using a magnetic compass. The field lines do not cross each other.

Region A has strong magnetic field. This is due to the strength of the field is proportional to the relative closeness of field lines.

Ans 17.

(a)

Tests		Ethanol (C_2H_5OH)	Ethanoic acid (CH_3COOH)
(i)	Physical state	In liquid state	In liquid state
(ii)	Taste	Burning	Sour
(iii)	$NaHCO_3$	$C_2H_5OH + NaHCO_3 \rightarrow$ No reaction	$CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + CO_2\uparrow + H_2O$ (CO_2 gas is evolved with a brisk effervescence.)
(iv)	Ester	When ethanol is heated with ethanoic acid in presence of 2-3 drops of conc. H_2SO_4, fruity smelling ester is formed. $C_2H_5OH + CH_3COOH \xrightarrow[H_2SO_4]{\text{Conc.}} CH_3COOC_2H_5 + H_2O$	When ethanoic acid is heated with ethanol in presence of 2-3 drops of conc. H_2SO_4 then fruity smelling ester is formed. $CH_3COOH + C_2H_5OH \xrightarrow[H_2SO_4]{\text{Conc.}} CH_3COOC_2H_5 + H_2O$

(b) When ethanol is heated with excess of concentrated H_2SO_4, it gets dehydrated to from ethane.

$$\underset{\text{Ethanol}}{CH_3CH_2OH} \xrightarrow[443\ K]{\text{Conc. } H_2SO_4} \underset{\text{Ethene}}{CH_2=CH_2} + H_2O$$

OR

(a) Alkene, having general formula as C_nH_{2n} and alkyne, having general formula as $C_nH_{2n} - 2$ are the class of hydrocarbons in which addition reaction is possible.

The essential conditions for addition reaction are

(i) Presence of unsaturated hydrocarbon.

(ii) Presence of catalyst such as Ni/Pt/Pd.

Let us take an example of ethene. It undergoes addition reaction with hydrogen when it is heated in the presence of nickel catalyst to form ethane. The reaction is known as hydrogenation.

$$\underset{\text{Ethene}}{CH_2=CH_2} + H_2 \xrightarrow[\text{Catalyst}]{Ni} \underset{\text{Ethane}}{CH_3-CH_3}$$

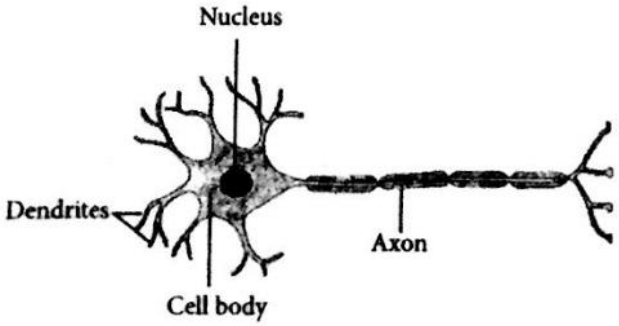
(b) Saturated hydrocarbon reacts with chlorine to from a substituted product. e.g.,

$$\underset{\text{Methane}}{CH_4} + Cl_2 \xrightarrow{h\nu} CH_3Cl + HCl$$

This reaction is called substitution reaction a here one hydrogen of methane is substituted by one chlorine atom.

Ans 18.

(a): Diagrammatic representation of a neuron is as follows:



(b) (i) Dendrites or dendrons acquire the information and set off a chemical reaction that creates an electrical impulse.

(ii) The electrical impulse travels from the dendrite to cell body and then along the axon to its nerve ending. At the end of the axon, the electrical impulse sets off the release of chemicals which cross the synapse (gap) and start a similar electrical impulse in a dendrite to the next neuron. This is a general scheme how nervous impulse travel in the body.

Ans 19. (a) Laws of refraction of light:

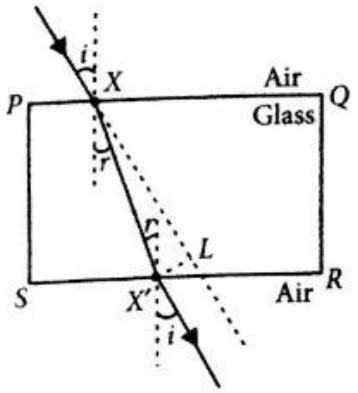
(i) The incident ray, the refracted ray and the normal to the interface of two transparent media at the point of incidence, all lie in the same plane.

(ii) The ratio of sine of angle of incidence to the sine of angle of refraction, for the light of a given colour and the given pair of media, is constant which is called the refractive index of the second medium with respect to the first.

$$i.e. \quad \frac{\sin i}{\sin r} = \text{constant} = n_{21}$$

This law is also known as Snell's law of refraction. Consider a rectangular glass slab PQRS placed in air. When a ray of light is incident on surface PQ (air-glass interface) making angle i with normal, it bends towards the normal. The refracted ray makes angle r with normal. Now, this refracted ray falls on surface RS (glass-air interface) and emergent ray bends away from the normal.

At air-glass interface, the refracted ray bends towards normal as it enters from rarer to denser medium and it bends away from normal at glass-air interface because light ray passes from denser to rarer medium.



As can be seen that at points X and X', the incident ray, the refracted ray and the normal all lie in the same plane.

Also refracted index of glass with respect to air,

$$n_{ga} = \frac{\sin i}{\sin r}$$

And refractive index of air with respect to glass,

$$n_{ag} = \frac{\sin r}{\sin i} \quad \text{or} \quad n_{ga} = \frac{1}{n_{ag}}$$

Ans 20. (i) (a) Ionic compounds have strong forces of attraction between the oppositely charged ions (e. g., H^+ and Cl^- ions), so they are solids. Covalent compounds have weak forces of attraction between their molecules, so they are usually liquids or gases.

(b) Ionic compounds are soluble in water but covalent compounds are insoluble in water.

(c) Ionic compounds conduct electricity when dissolved in water or in molten state because they contain ions (charged particles). But, covalent compounds like glucose do not conduct electricity because they do not contain ions.

(ii) (a) The metal 'M' which is in the middle of the reactivity series (such as iron, zinc, lead, copper, etc.) is moderately reactive. So, for obtaining such metals from their compounds such as sulphides and carbonates, they are first converted into their oxides by the process of roasting and calcination respectively.

$$\underset{\text{Zinc sulphide}}{2ZnS_{(s)}} + 3O_{2(g)} \xrightarrow{\text{Heat}} 2ZnO_{(s)} + 2SO_{2(g)}$$
(Sulphide ore)

$$\underset{\text{Zinc carbonate}}{ZnCO_{3(s)}} \xrightarrow{\text{Heat}} ZnO_{(s)} + 2CO_{2(g)}$$
(Carbonate ore)

The metal oxides (MO) are then reduced to the corresponding metals by using suitable reducing agents such as carbon. For example, zinc metal from its oxide is obtained as follows:

$$\underset{\text{Zinc oxide}}{ZnO_{(s)}} + C_{(s)} \longrightarrow \underset{\text{Zinc}}{Zn_{(s)}} + CO_{(g)}$$

(b) The metal 'N which is high up in the reactivity series (such as sodium, magnesium, calcium, aluminium, etc.), is very reactive and cannot be obtained from its compound by heating with carbon. Therefore, such metals are obtained by electrolytic reduction of their molten salts. For example, sodium is obtained by the electrolysis of molten sodium chloride

$(NaCl)$

At cathode: $Na^+ + e^- \longrightarrow Na$

At anode: $2Cl^- \rightarrow Cl_2 + 2e^-$

Ans 21. (a) Eco-friendly activities in daily life are:

(i) Separation of biodegradable and non-biodegradable substances

(ii) Use of gunny bags/paper bags in place of polythene/plastic bags

(iii) Use of compost and vermicompost in place of fertilisers

(b) We can reuse plastic and glass jars of jams and pickles, etc., for the purpose of storage of things like salt, sugar, tea, etc., whereas we can recycle newspapers, plastic of some types, broken glass and metal wares for making fresh paper, plastic, glass and metal objects.

OR

The proper management of natural resources using it wisely and judiciously so that it is available for the coming generation also is called sustainable development.

The population is increasing, demand for these resources is also increasing but they are limited in nature. The management would prevent the exploitation of these resources and keep them available for future generations.

Forest: Many industries like timber, wood, bidi, tendu leaves, etc., are dependent on the trees in the forest. They keep cutting the trees for use. This need to be managed properly and checked that new plantation of trees take place, animals are not harmed and are preserved.

Wildlife: All animals in the forest are disturbed due to the intervention of people into the forest. They are also killed for trade of skin, fur, tusk, horn, etc. If the animals in the forest are not managed and taken care, then they will get extinct which will disturb the ecological balance of the earth.

Water resources: The main water resources are rivers, lakes, ponds, underground water. The resources of water are getting polluted and the underground water is also discharged, used and the level of water is declining. Hence, the recharge of water under the ground by rain water harvesting is necessary.

Ans 22. White precipitate of barium sulphate is formed.

$$\underset{\text{Barium chloride}}{BaCl_{2(aq)}} + \underset{\text{Sodium sulphate}}{Na_2SO_{4(aq)}} \longrightarrow \underset{\text{Barium sulphate (white ppt.)}}{BaSO_{4(s)}} + \underset{\text{Sodium chloride}}{2NaCl_{(aq)}}$$

Ans 23. (a) acetic acid when added to phenolphthalein solution then there is no reaction and it remains colourless.

(b) Acetic acid gets dissolved in distilled water.

(c) Acetic acid turns the colour of universal indicator to orange.

OR

Two physical properties of acetic acid are:

(i) it readily dissolves in water.

(ii) it smells like a vinegar.

When sodium hydrogen carbonate is added to this acid, carbon dioxide gas is released with the brisk effervescence. The gas evolved is colourless and odourless.

$$CH_3COOH + NaHCO_3 \longrightarrow CH_3COONa + CO_2\uparrow + H_2O$$

Ans 24. Towards the lens Magnification decreases.

Intensity of the image increases.

And 25.

$$V = 8.0\ \text{V}\ ;\ I = 400\ \text{mA}$$

$$R = \frac{V}{I} = \frac{8\ \text{V}}{400\ \text{mA}} = \frac{8 \times 1000\ \text{V}}{400\ \text{A}} = 20\ \Omega$$

Ans 26. Binary fission and budding are faster process of reproduction. This is so because asexual reproduction involves simple cell division whereas in sexual reproduction formation of gametes and fertilisation are involved.

Ans 27. Economic importance of yeast are:

(i) Yeast is of greatest importance to mankind because of its property of alcoholic fermentation. In the absence of oxygen, yeast converts sugar of wine graps into alcohol and carbon dioxide.

(ii) Yeasts also produce vitamin B_1 (riboflavin).

(iii) Yeasts are used in making bread in bakeries.