Chemical Reactions and Equations

Q 1 Identify 'x', 'y' and 'z' in the following reaction : $2KClO_{3(x)} \xrightarrow{y} 2KCl_x + O_{2(z)}$

a) x = gas; y = reaction condition; z = gas
b) x = solid; y = liquid; z = gas
c) x = number of moles of $KClO_3$; y = reaction condition; z = number of molecules of oxygen
d) x = physical state of $KClO_3$ and KCl; y = reaction condition, z = physical state of O_2.

Q 2 Assertion (A): Following is a balanced chemical equation for the action of steam on iron :

$$3Fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$$

Reason (R): The law of conservation of mass holds good for a chemical equation.

Q 3 Write balanced chemical equations for the following chemical reactions:
(a) Hydrogen + Chlorine → Hydrogen chloride
(b) Lead + Copper chloride → Lead chloride + Copper
(c) Zinc oxide + Carbon → Zinc + Carbon monoxide

Q 4 Calcium oxide reacts vigorously with water to produce slaked lime.

$CaO + H_2O \rightarrow Ca(OH)_2$

This reaction can be classified as

(A) Combination reaction
(B) Exothermic reaction
(C) Endothermic reaction
(D) Oxidation reaction

Which of the following is a correct option?
(i) (A) and (C) (ii) (C) and (D) (iii) (A), (C) and (D) (iv) (A) and (B)

Q 5 When hydrogen sulphide gas is passed through a blue solution of copper sulphate, a black precipitate of copper sulphide is obtained and the sulphuric acid so formed remains in the solution. The reaction is an example of a
(a) combination reaction (b) displacement reaction
(c) decomposition reaction (d) double displacement reaction.

Q 6 In a double displacement reaction such as the reaction between sodium sulphate solution and barium chloride solution :
(A) exchange of atoms takes place (B) exchange of ions takes place
(C) a precipitate is produced (D) an insoluble salt is produced
The correct option is
(i) (B) and (D) (ii) (A) and (C) (iii) only (B) (iv) (B), (C) and (D)

Q 7 State the type of chemical reactions, represented by the following equations :

a) $A + BC \rightarrow AC + B$
b) $A + B \rightarrow C$
c) $Q + RS \rightarrow PS + RQ$
d) $A_2O_3 + 2B \rightarrow B_2O_3 + 2A$

Q 8 1 g of copper powder was taken in a China dish and heated. What change takes place on heating? When hydrogen gas is passed over this heated substance, a visible change is seen in it. Give the chemical equations of reactions, the name and the colour of the products formed in each case

Q 9 A compound 'A' is used in the manufacture of cement. When dissolved in water, it evolves a large amount of heat and forms compound 'B'.
(i) Identify A and B.
(ii) Write chemical equation for the reaction of A with water.
(iii) List two types of reaction in which this reaction may be classified.

Q10 Mention with reason the colour changes observe when:
(i) silver chloride is exposed to sunlight.
(ii) copper powder is strongly heated in the presence of oxygen.
(iii) a piece of zinc is dropped in copper sulphate solution

Q11 Lead nitrate solution is added to a test tube containing potassium iodide solution.
(a) Write the name and colour of the compound precipitated.
(b) Write the balanced chemical equation for the reaction involved.
(c) Name the type of this reaction justifying your answer.

Q12 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

Q13 2 g of ferrous sulphate crystals are heated in a dry boiling tube.
(a) List any two observations.
(b) Name the type of chemical reaction taking place.
(c) Write balanced chemical equation for the reaction and name the products formed.

Q14 Decomposition reactions require energy either in the form of heat or light or electricity for breaking down the reactants. Write one equation each for decomposition reactions where energy is supplied in the form of heat, light and electricity.

Q15 Take 3 g of barium hydroxide in a test tube, now add about 2 g of ammonium chloride and mix the contents with the help of a glass rod. Now touch the test tube from outside.
(i) What do you feel on touching the test tube?
(ii) State the inference about the type of reaction occurred.
(iii) Write the balanced chemical equation of the reaction involved.

Q16
a) A solution of potassium chloride when mixed with silver nitrate solution, an insoluble white substance is formed. Write the chemical reaction involved and also mention the type of the chemical reaction.

b) Ferrous sulphate when heated, decomposes with the evolution of a gas having a characteristic odour of burning sulphur. Write the chemical reaction involved and identify the type of reaction

Q17 What is a reduction reaction?
Identify the substances that are oxidised and the substances that are reduced in the following reactions. (Board Term I, 2015)

(a) $Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$

(b) $2PbO + C \rightarrow 2Pb + CO_2$

Q18 (a) Can a displacement reaction be a redox reaction? Explain with the help of an example.
(b) Write the type of chemical reaction in the following:
(i) Reaction between an acid and a base
(ii) Rusting of iron.

Q19
i) Why is respiration considered as an exothermic reaction?

ii) Write chemical name and the formula of the brown gas produced during thermal decomposition of lead nitrate.

iii) Why do chips manufactures flush bags of chips with gas such as nitrogen?

Q20 Write the chemical equation of the reaction in which the following changes have taken place with an example of each:
(i) Change in colour (ii) Change in temperature (iii) Formation of precipitate

Q21 (a) Define a balanced chemical equation. Why should an equation be balanced?
(b) Write the balanced chemical equation for the following reaction:

i) Phosphorus burns in presence of chlorine to form phosphorus penta chloride.

ii) Burning of natural gas.

iii) The process of respiration.

Q22 What is observed when a solution of potassium iodide solution is added to a solution of lead nitrate? Name the type of reaction. Write a balanced chemical equation to represent the above chemical reaction.

Q23 Why does the colour of copper sulphate solution change when an iron nail is dipped in it? Write two observations.

Q24 Translate the following statement into chemical equation and then balance it Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate. State the two types in which this reaction can be classified.

Q25 State one basic difference between a physical change and a chemical change.

Q26
a) A solution of substance 'X' is used for white washing. What is the substance 'X'? State the chemical reaction of 'X' with water.
b) Why does the colour of copper sulphate solution change when an iron nail is dipped in it?

Q27 What is a redox reaction? When a magnesium ribbon burns in air with a dazzling flame and forms a white ash, is magnesium oxidised or reduced? Why?

Q28 In electrolysis of water, why is the volume of gas collected over one electrode double that of gas collected over the other electrode?

Q29 Distinguish between a displacement reaction and a double displacement reaction.

Q30 What do you mean by exothermic and endothermic reactions? Give examples.

Acids Bases and Salts

Q 1 With the help of an example explain what happens when a base reacts with a non-metallic oxide. What do you infer about the nature of non-metal oxide?

Q 2 What is observed when carbon dioxide gas is passed through lime water
i) for a short duration? ii) for a long duration?
Also write the chemical equations for the reactions involved.

Q 3 2 mL of sodium hydroxide solution is added to a few pieces of granulated zinc metal taken in a test tube. When the content are warmed, a gas evolves which is bubbled through a soap solution before testing. Write the equation of the chemical reaction involved and the test to detect the gas. Name the gas which will be evolved when the same metal reacts with dilute solution of a strong acid.

Q 4 To. a solution of sodium hydroxide in a test tube, two drops of phenolphthalein are added.
i) State the colour change observed.
ii) If dil HCl is added dropwise to the solution, what will be the colour change?
iii) adding few drops of NaOH solution to the above mixture the colour of the solution reappears. Why?

Q 5 A cloth'strip dipped in onion juice is used for testing a liquid 'X. The liquid 'X changes its odour. Which type of an indicator is onion juice? The liquid 'X turns blue litmus red. List the observations the liquid 'X will show on reacting with the following :
(a) Zinc granules
(b) Solid sodium carbonate
Write the chemical equations for the reactions involved.

Q 6 Sugandha prepares HCl gas in her school laboratory using certain chemicals. She puts both dry and wet blue litmus papers in contact with the gas.
(i) Name the reagents used by Sugandha to prepare HCl gas.
(ii) State the colour changes observed with the dry and wet blue litmus papers.
(iii) Show the formation of ions when HCl gas combines with water.

Q 7 An aqueous solution 'A' turns phenolphthalein solution pink. On addition of an aqueous solution 'B' to 'A' the pink colour disappears. The following statement is true for solution 'A' and 'B':
(a) A is strongly basic and B is a weak base.
(b) A is strongly acidic and B is a weak acid.
(c) A has pH greater than 7 and B has pH less than 7.
(d) A has pH less than 7 and B has pH greater than 7

Q 8 Out of HCl and CH_3COOH, which one is a weak acid and why? Explain with the help of an example

Q 9 **(a) Three acidic solutions A, B and C have pH = 0, 3 and 5 respectively.**
(i) Which solution has highest concentration of H^+ ions?
(ii) Which solution has the lowest concentration of H^+ ions?
(b) How concentrated sulphuric acid can be diluted? Describe the process

Q10 **A compound P forms the enamel of teeth. It is the hardest substance of the body. It doesn't dissolve in water but gets corroded when the pH is lowered below 5.5.**
(a) Identify the compound P.
(b) How does it undergo damage due to eating chocolate and sweets? What should we do to prevent tooth decay?

Q11 **Write the chemical formula of Bleaching powder. How is bleaching powder prepared? For what purpose is it used in drinking water?**

Q12 **List the important products of the Chlor-alkali process. Write one important use of each**

Q13 **How is washing soda prepared from sodium carbonate? Give its chemical equation. State the type of this salt. Name the type of hardness of water which can be removed by it?**

Q14 **Give reasons for the following:**
(i) Only one half of water molecule is shown in the formula of plaster of Paris.
(ii) Sodium hydrogen carbonate is used as an antacid.
(iii) On strong heating, blue coloured copper sulphate crystals turn white.

Q15 **During electrolysis of brine, a gas 'G' is liberated at anode. When this gas 'G' is passed through slaked lime, a compound 'C' is formed, which is used for disinfecting drinking water.**
(i) Write formula of 'G' and 'C'.
(ii) State the chemical equations involved.
(iii) What is common name of compound 'C'? Give its chemical name

Q16 **The pH of a salt used to make tasty and crispy pakoras is 14. Identify the salt and write a chemical equation for its formation. List its two uses.**

Q17 **Write one point of difference between each of the following:**
(i) A hydrated salt and an anhydrous salt.
(ii) Washing soda and soda ash.
(iii) Baking soda and baking powder.

Q18 **A white coloured powder is used by doctors for supporting fractured bones.**
(a) Write chemical name and formula of the powder.
(b) When this white powder is mixed with water a hard solid mass is obtained. Write balanced chemical equation for this change.

Q19
(a) Define an acid-base indicator. Mention one synthetic acid-base indicator.
(b) If someone in the family is suffering from a problem of acidity after overeating, which of the following substances would you suggest as a remedy? Lemon juice, vinegar or baking soda solution. Mention the property on the basis of which you will choose the remedy.

Q20 **Define water of crystallisation. Give the chemical formula for two compounds as examples. How can it be proved that the water of crystallisation makes a difference in the state and colour of the compounds?**

Q21
a) A student dropped a few pieces of marble in dilute hydrochloric acid contained in a test tube. The evolved gas was passed through lime water. What change would be observed in lime water? Write balanced chemical equations for both the changes observed.
b) State the chemical property in each case on which the following uses of baking soda are based:
(i) as an antacid
(ii) as a constituent of baking powder.

Q22 **You have three solutions – A, B and C having a pH of 6, 2 and 9 respectively. Arrange these solutions in increasing order of hydrogen ion concentration. Which of the three is most acidic? What happens to the hydrogen ion concentration in A as it is diluted?**

Q23 **a) Write the chemical formula of hydrated copper sulphate and anhydrous copper sulphate. Giving an activity illustrate how these two are interconvertible.**
(b) Write chemical names and formulae of plaster of Paris and gypsum.

Q24 **Alcohols and Glucose contain hydrogen but are not categorized as acids. Why?**

Q25 **State reason for the following statements :**

i) **Tap water conducts electricity whereas distilled water does not.**
ii) **Dry hydrogen gas does not turn blue litmus red.**
iii) **During summer season, a milk man usually adds a very small amount of baking soda.**

Q26 **What is a neutralisation reaction? Give two examples**

Metals And Non-Metals

Q 1 **Reverse of the following chemical reaction is not possible:**

Zn_s + $CuSO_4 \rightarrow ZnSO_4$ + Cu

Justify this statement with reason

Q 2 **Name a metal which:**
(a) is the best conductor of heat. **(b) has a very low melting point.**
(c) does not react with oxygen even at high temperature. **(d) is most ductile**

Q 3 **What is meant by amphoteric oxides? Give two examples**

Q 4 **Give reason for the following:**
(i) Hydrogen gas is not evolved when most of the metals react with nitric acid.
(ii) Zinc oxide is considered as an amphoteric oxide.
(iii) Metals conduct electricity

Q 5 **(a) Why does calcium start floating when it reacts with water? Write the balanced chemical equation of the reaction.**
(b) Name two metals which do not react with water

Q 6 **State what would happen if:**
(i) some zinc pieces are placed in blue copper sulphate solution.
(ii) some'copper pieces are placed in green ferrous sulphate solution.
(iii) an iron nail is dipped in a solution of copper sulphate for some time

Q 7 **Give reason:**
(a) Aluminium is a reactive metal but is still used for packing food articles.
(b) Calcium starts floating when water is added to it.

Q 8 **A metal 'X' combines with a non-metal 'Y' by the transfer of electrons to form a compound Z.**
(i) State the type of bond in compound Z.
(ii) What can you say about the melting point and boiling point of compound Z?
(iii) Will this compound dissolve in kerosene or petrol?
(iv) Will this compound be a good conductor of electricity?

Q 9
a) **(i) Write two properties of gold which make it the most suitable metal for ornaments.**
(ii) Name two metals which are the best conductors of heat.
(iii) Name two metals which melt when you keep them on your palm.
b) **Explain the formation of ionic compound CaO with electron-dot structure. Atomic numbers of calcium and oxygen are 20 and 8 respectively**

Q10 **(i) Carbonate of metal 'X is abundant in earth crust and its hydroxide is used in 'white washing'. Identify metal 'X'**
(ii) How will you convert this carbonate into its oxide? Name the process and write its equation.

Q11 **Zinc is a metal found in the middle of the activity series of metals. In nature, it is found as a carbonate ore, $ZnCO_3$. Mention the steps carried out for its extraction from the ore. Support with equations.**

Q12 **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 form their ores? Take an example to explain the process of extraction along with chemical equations**

Q13 **Write balanced chemical equations to explain what happens, when**
(i) Mercuric oxide is heated.
(ii) Mixture of cuprous oxide and cuprous sulphide is heated.
(iii) Aluminium is reacted with manganese dioxide.
(iv) Ferric oxide is reduced with aluminium.
(v) Zinc carbonate undergoes calcination

Q14 a) Write the steps involved in the extraction of pure metals in the middle of the activity series from their carbonate ores.
b) How is copper extracted from its sulphide ore? Explain the various steps supported by chemical equations. Draw labelled diagram for the electrolytic refining of copper

Q15 Assertion (A): The metals and alloys are good conductors of electricity.
Reason (R) : Bronze is an alloy of copper and tin and it is not a good conductor of electricity

Q16 Why some metal surfaces acquire a dull appearance when they are exposed to moist air? Write colour acquired by the surfaces of copper and silver in such situation and also write the chemical names of the substances due to which it happens.

Q17 (a) Name the following:
i) Metal that can be cut by knife
ii) Lustrous non-metal
iii) Metal that exists in liquid state at room temperature
iv) Most malleable and ductile metal
v) Metal that is best conductor of electricity
vi) Non-metal that can exist in different forms
(b) How are alloys better than metals? Give composition of solder and amalgam.

Q18 Give reason for the following :
(a) Ionic compounds have higher melting point and higher boiling point.
(b) Sodium is kept immersed in kerosene.
(c) Reaction of calcium with water is less violent.
(d) Silver articles become black after some time when exposed to air.
(e) Prior to reduction the metal sulphides and carbonates must be converted into metal oxides for extracting metals

Q19 Mention the names of the metals for the following:
(i) Two metals which are alloyed with iron to make stainless steel.
(ii) Two metals which are used to make jewellary

Q20 An element 'X' replaces iron from the aqueous solution of iron sulphate. List your observations when the element 'X' is treated with the aqueous solutions of copper sulphate, zinc sulphate and silver nitrate solution. Depending on the statements, arrange X, Zn, Cu and Ag in increasing order of their reactivities.

Carbon and its Compounds

Q 1 Covalent compounds have low melting and boiling point. Why?
What are covalent compounds? Why are they different from ionic compounds? List their three characteristic properties.

Q 2 Assertion (A) : Following are the members of a homologous series :
CH_3OH, CH_3CH_2OH, $CH_3CH_2CH_2OH$
Reason (R) : A series of compounds with same functional group but differing by -CH_2 unit is
called homologous series.

Q 3 Write the molecular formula of first two members of homologous series having functional group -Cl

Q 4 Give reasons for the following:
(i) Element carbon forms compounds mainly by covalent bonding.
(ii) Diamond has high melting point.
(iii) Graphite is a good conductor of electricity.

Q 5 Name a cyclic unsaturated carbon compound.

Q 6 Write the name and structure of an alcohol with four carbon atoms in its molecule.

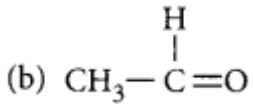
Q 7 Write the molecular formula of first two members of homologous series having functional group -OH.

Q 8 Write the name and formula of the 2nd member of homologous series having general formula C_nH_{2n-2}.

Q 9 **Name the following compounds :**

(a) $CH_3 – CH_2 – OH$

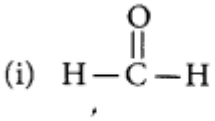
(b)



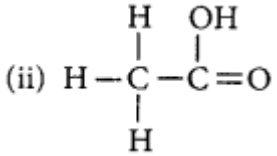
Q10 **State two properties of carbon which lead to a very large number of carbon compounds.**

Q11 **Define the term functional group. Identify the functional group present in**

(i)



(ii)

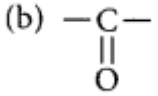


Q12 **Elements forming ionic compounds attain noble gas electronic configuration by either gaining or losing electrons from their valence shells. Explain giving reason why carbon cannot attain such a configuration in this manner to form its compounds. Name the type of bonds formed in ionic compounds and in the compounds formed by carbon. Also explain with reason why carbon compounds are generally poor conductors of electricity.**

Q13 **Write the name of each of the following functional groups:**

(a) -OH

(b)



Q14 **Write the name and molecular formula of the first member of the homologous series of alkynes.**

Q15 **Write the molecular formula of the following compounds and draw their electron-dot structures:**

(i) Ethane (ii) Ethene (iii) Ethyne

Write the structural formula of benzene, C_6H_6.

Q16 **An aldehyde as well as a ketone can be represented by the same molecular formula, say C_3H_6O. Write their structures and name them. State the relation between the two in the language of science**

Q17 **What is meant by isomers? Draw the structures of two isomers of butane, C_4H_{10}. Explain why we cannot have isomers of first three members of alkane series.**

Q18 **Give reason for the following : Kerosene does not decolourise bromine water while cooking oils do.**

Q19 **What happens when 5% alkaline $KMnO_4$ solution is added drop by drop to warm ethanol taken in a test tube? State the role of alkaline $KMnO_4$ solution in this reaction**

Q20 **Two carbon compounds X and Y have the molecular formula C_4H_8 and C_5H_{12} respectively. Which one of these is most likely to show addition reaction? Justify your answer. Also give the chemical equation to explain the process of addition reaction in this case.**

Q21 **What is an oxidising agent? What happens when an oxidising agent is added to propanol? Explain with the help of a chemical equation.**

Q22 **Write the name and general formula of a chain of hydrocarbons in which an addition reaction with hydrogen is possible. State the essential condition for an addition reaction. Stating this condition, write a chemical equation giving the name of the reactant and the product of the reaction.**

Q23 **Write the structural formula of ethanol. What happens when it is heated with excess of cone. H_2SO_4 at 443 K? Write the chemical equation for the reaction stating the role of cone. H_2SO_4 in this reaction.**

Q24 **What happens when (write chemical equation in each case)**

(a) ethanol is burnt in air?

(b) ethanol is heated with excess cone. H_2SO_4 at 443 K?

(c) a piece of sodium is dropped into ethanol?

Q25 **When ethanol reacts with ethanoic acid in the presence of cone. H_2SO_4, a substance with fruity smell is produced. Answer the following:**

i) State the class of compounds to which the fruity smelling compounds belong. Write the chemical equation for the reaction and write the chemical name of the product formed.

ii) State the role of cone. H_2SO_4 in this reaction.

Q26 On dropping a small piece of sodium in a test tube containing carbon compound 'X' with molecular formula $C_2\ H_6O$, a brisk effervescence is observed and a gas 'Y' is produced. On bringing a burning splinter at the mouth of the test tube the gas evolved burns with a pop sound. Identify 'X' and 'Y'. Also write the chemical equation for the reaction. Write the name and structure of the product formed, when you heat 'X' with excess cone, sulphuric acid

Q27 Write three different chemical reactions showing the conversion of ethanoic acid to sodium ethanoate. Write balanced chemical equation in each case. Write the name of the reactants and the products other than ethanoic acid and sodium ethanoate in each case.

Q28 An organic compound 'P' is a constituent of wine. 'P' on reacting with acidified $K_2Cr_2O_7$ forms another compound 'Q'. When a piece of sodium is added to 'Q', a gas 'R' evolves which burns with a pop sound. Identify P, Q and R and write the chemical equations of the reactions involved.

Q29 List two tests for experimentally distinguishing between an alcohol and a carboxylic acid and describe how these tests are performed.

Q30 A carboxylic acid (molecular formula, $C_2H_4O_2$) reacts with an alcohol in the presence of an acid catalyst to form a compound 'X'. The alcohol on oxidation with alkaline $KMnO_4$ followed by acidification gives the same carboxylic acid $C_2H_4O_2$. Write the name and structure of (i) carboxylic acid, (ii) alcohol and (iii) the compound 'X'

Q31 A carbon compound 'P' on heating with excess cone. H_2SO_4 forms another carbon compound 'Q' which on addition of hydrogen in the presence of nickel catalyst forms a saturated carbon compound 'R' One molecule of 'R' on combustion forms two molecules of carbon dioxide and three molecules of water. Identify P, Q and R and write chemical equations for the reactions involved.

Q32 Several factories were pouring their wastes in rivers A and B. Water samples were collected from these two rivers. It was observed that sample collected from river A was acidic while that of river B was basic. The factories located near A and B are

a) Soaps and detergents factories near A and alcohol distillery near B.
b) Soaps and detergents factories near B and alcohol distillery near A.
c) Lead storage battery manufacturing factories near A and soaps and detergents factories near B.
d) Lead storage battery manufacturing factories near B and soaps and detergents factories near A

Q33 Why does micelle formation take place when soap is added to water? Why are micelles not formed when soap is added to ethanol?

Q34 Soaps and detergents are both, types of salts. State the difference between the two. Write the mechanism of the cleansing action of soaps. Why do soaps not form lather (foam) with hard water? Mention any two problems that arise due to the use of detergents instead of soaps

Q35 What are detergents chemically? List two merits and two demerits of using detergents for cleansing. State the reason for the suitability of detergents for washing, even in the case of water having calcium and magnesium ions.

Life Processes

Q 1 Mention the raw materials required for photosynthesis.

Q 2 Name the glands present in the wall of the stomach that release secretions for digestion of food. Write the three components of secretion that are released by these glands

Q 3 (a) State the role played by the following in the process of digestion :
(i) Enzyme trypsin (ii) Enzyme lipase-
(b) List two functions of finger-like projections present in the small intestine.

Q 4 Differentiate between autotrophs and hetero- trophs and give one example of each.

Q 5 **(a) What is peristaltic movement?**
(b) 'Stomata remain closed in desert plants during daytime'. How do they do photosynthesis?

Q 6 **Diffusion is insufficient to meet the oxygen requirement of multicellular organisms like human. State reason.**

Q 7 **Draw a flow chart to show the breakdown of glucose by various pathways**

Q 8 **Write two different ways in which glucose is oxidised to provide energy in human body. Write the products formed in each case**

Q 9 **Write three points of difference between breathing and respiration**

Q10
a) **Write two water conducting tissues present in plants. How does water enter continuously into the root xylem?**
b) **Explain why plants have low energy needs as compared to animals**

Q11 **Write three types of blood vessels. Give one important feature of each.**
List in tabular form three differences between arteries and veins.

Q12 **Name the vein which brings blood to left atrium from lungs.**

Q13 **(a) Why is nutrition necessary for the human body?**
(b) What causes movement of food inside the alimentary canal?
(c) Why is small intestine in herbivores longer than in carnivores?
(d) What will happen if mucus is not secreted by the gastric glands?

Q14 **Give reasons:**
a) **Ventricles have thicker muscular walls than atria.**
b) **Transport system in plants is slow.**
c) **Circulation of blood in aquatic vertebrates differs from that in terrestrial vertebrates.**
d) **During the daytime, water and minerals travel faster through xylem as compared to the night.**
e) **Veins have valves whereas arteries do not.**

Q15 **a) Mention any two components of blood.**
(b) Trace the movement of oxygenated blood in the body.

Q16 **(a) Define excretion.**
(b) Name the basic filtration unit present in the kidney.
(c) Draw excretory system in human beings and label the following organs of excretory system which perform following functions:
(i) form urine
(ii) is a long tube which collects urine from kidney
(iii) store urine until it is passed out.

Q17 **What are nephrons? How is a nephron involved in the filtration of blood and formation of urine?**

Q18 **Describe the process and importance of double circulation in humans.**

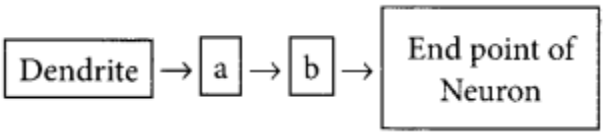
Q19 **Write three points of difference between respiration in plants and respiration in animals.**

Q20 **(a) State reasons for the following:**
(i) Herbivores need a longer small intestine while carnivores have shorter small intestine.
(ii) The lungs are designed in human beings to maximise the area for exchange of gases.
(b) The rate of breathing in aquatic organisms'is much faster than that seen in terrestrial organisms.

Q21 **Explain with the help of neat and well labelled diagrams the different steps involved in nutrition in Amoeba.**

Control & Coordination

Q 1 a) Name one gustatory receptor and one olfactory receptor in human beings.
b) Write a and b in the given flow chart of neuron through which information travels as an electrical impulse.



Q 2 a) "Reflex arcs continue to be more efficient for quick responses". Justify this statement giving reason
b) Trace the sequence of events which occur in our body when a bright light is focussed on your eyes.

Q 3 What are plant hormones? Name the plant hormones responsible for the following :
(i) Growth of stem (ii) Promotion of cell division (iii) Inhibition of growth
(iv) Elongation of cells

Q 4 (a) Draw a neat diagram of a neuron and label (i) dendrite and (ii) axon.
(b) Which part of the human brain is:
(i) the main thinking part of the brain?
(ii) responsible for maintaining the posture and balance of the body?

Q 5 Why is chemical communication better than electrical impulses as a means of communication between cells in a multicellular organisms?

Q 6 Mention three major regions of brain. Write one function of each

Q 7 A cheetah, on seeing a prey moves towards him at a very high speed. What causes the movement of his muscles? How does the chemistry of cellular components of muscles change during this event?

Q 8 Which is the largest and most prominent part of the brain?

Q 9 Name the hormones secreted by the following endocrine glands and specify one function of each: (a) Thyroid (b) Pituitary (c) Pancreas.

Q10 (a) An old man is advised by his doctor to take less sugar in his diet. Name the disease from which the man is suffering. Mention the hormone due to imbalance of which he is suffering from this disease. Which endocrine gland secretes this hormone?
(b) Name the endocrine gland which secretes growth hormone. What will be the effect of the following on a person
(i) deficiency of growth hormone
(ii) excess secretion of growth hormone?

Q11 State the function of: (i) gustatory receptors, and (ii) olfactory receptors

Q12 Write one example each of the following tropic movements :
(i) Positive phototropism (ii) Negative phototropism (iii) Positive geotropism
(iv) Negative geotropism (v) Hydrotropism (vi) Chemotropism

Q13 Why is it advised to use iodised salt in our diet?

Q14 i) Name the hormones that are released in human males and females when they reach puberty.
ii) Name a gland associated with brain. Which problem is caused due to the deficiency of the hormone released by this gland?

Q15 A gland secretes a particular hormone. The deficiency of this hormone in the body causes a particular disease in which the blood sugar level rises.
(i) Name the gland and the hormone secreted by it.
(ii) Mention the role played by this hormone.
(iii) Name the disease caused due to deficiency of this hormone.

Q16 Name the hormone required for the following. Also mention the name of endocrine gland from which that hormone is secreted:
(a) Lowering of blood glucose.
(b) Development of moustache and beard in human males.
(c) Metabolism of carbohydrates, fats and proteins.

Q17 (a) How is brain protected from injury and shock?
(b) Name two main parts of hind brain and state the functions of each

Q18 Name any three endocrine glands in human body and briefly write the function of each of them.

Q19 What is chemotropism? Give one example. Name any two plant hormones and mention their functions

Q20 State the functions of any three of the structural and functional unit of nervous system.

Q21
a) Mention the function of adrenaline hormone.
b) Name the hormone secreted by human testes. State its functions.
c) Name and explain the function of the hormone secreted by the pituitary gland in humans.

What is the function of thyroxine hormone in our body?

How do Organism Reproduce?

Q 1 Reproduction is one of the most important characteristic 'of living beings. Give three reasons in support of the statement

Q 2 What happens when
(a) accidently, Planaria gets cut into many pieces-
(b) Bryophyllum leaf falls on the wet soil
(c) on maturation sporangia of Rhizopus bursts?

Q 3 List two functions of ovary of human female reproductive system.

Q 4 What is DNA copying? State its importance

OR

What is the effect of DNA copying, which is not perfectly accurate, on the reproduction process? How does the amount of DNA remain constant through each new generation is a combination of DNA copies of two individuals?

Q 5 Why is fertilisation not possible without pollination?

Q 6 List two unisexual and bisexual flowers

Q 7 Write one main difference between asexual and sexual mode of reproduction. Which species is likely to have comparatively better chances of survival – the one reproducing asexually or the one reproducing sexually? Give reason to justify your answer.

Q 8 Name the method by which Spirogyra reproduces under favourable conditions. Is this method sexual or asexual?
How does Plasmodium reproduce. Is this method sexual or asexual?

Q 9 List four advantages of vegetative propagation.

Q10 How do Plasmodium and Leishmania reproduce? Write one difference in their mode of reproduction.

Q11 "The chromosomal number of the sexually producing parents and their offspring is the same". Justify this statement

Q12 (a) What provides nutrition to human sperms? State the genetic constitution of a sperm.
(b) Mention the chromosome pair present in a zygote which determines the sex of
(i) a female child and (ii) a male child.

Q13 Define the term pollination. Differentiate between self-pollination and cross-pollination. What is the significance of pollination?

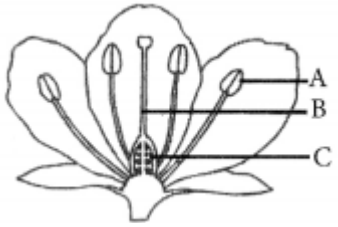
Q14 State the changes that take place in the uterus when:
(a) Implantation of embryo has occurred.
(b) Female gamete/egg is not fertilised.

Q15 List any two steps involved in sexual reproduction and write its two advantage.

Q16 List three techniques that have been developed to prevent pregnancy. Which one of these techniques is not meant for males? How does the use of these techniques have a direct impact on the health and prosperity of a family?

Q17 How do organisms, whether reproduced asexually or sexually maintain a constant chromosome number through several generations? Explain with the help of suitable example.

Q18 Name the parts A, B and C shown in the following diagram and state one function of each.

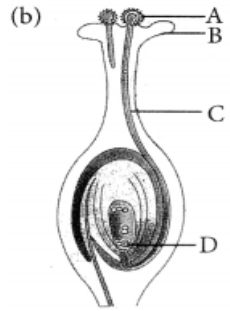


Q19 What are the functions of testes in the human male reproductive system? Why are these located outside the abdominal cavity? Who is responsible for bringing about changes in appearance seen in boys at the time of puberty?

Q20 (a) Mention the role of the following organs of human male reproductive system.
(i) Testes (ii) Scrotum (iii) Vas deferens (iv) Prostate gland
(b) What are the two roles of testosterone?

Q21 (a) List two reasons for the appearance of variations among the progeny formed by sexual reproduction.

(i) Name the part marked A in the diagram.
(ii) How does A reaches part B?
(iii) State the importance of the part C.
(iv) What happens to the part marked D after fertilisation is over?



Q22 What are sexually transmitted diseases? List two examples each of diseases caused due to
(i) bacterial infection and (ii) viral infection.
Which device or devices may be used to prevent the spread of such diseases?

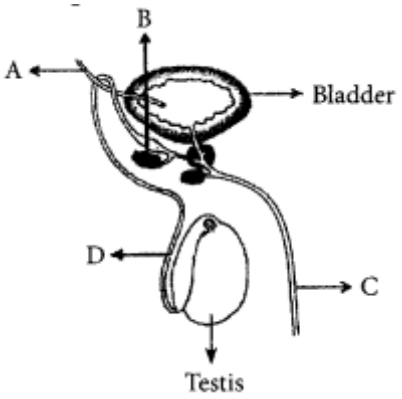
Q23 What is placenta? Explain its function in humans

Q24 Name the two reproductive parts of a bisexual flower which contain the germ cells. State the location and function of its female reproductive part.

Q25 What does HIV stands for? Is AIDS an infectious disease? List any four modes of spreading AIDS

Q26
a) In the female reproductive system of human beings, state the functions of:
(i) Ovary (ii) Oviduct.
b) Mention the changes which the uterus undergoes, when
(i) it has to receive a zygote. (ii) no fertilisation takes place.
c) State the functions of placenta.

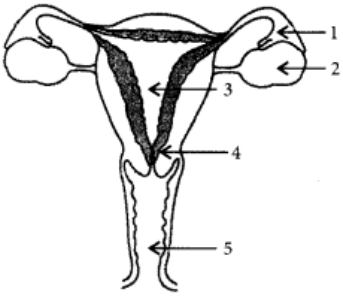
Q27 Based on the given diagram answer the questions given below:
a) Label the parts A, B, C and D.
b) Name the hormone secreted by testis and mention its role.
c) State the functions of B and C in the process of reproduction



Q28 (a) Name the respective part of human female reproductive system :
(i) that produces egg
(ii) where fusion of egg and sperm takes place, and
(iii) where zygote gets implanted.
(b) Describe in brief what happens to the zygote after it gets implanted.

Q29 (a) Identify the given diagram. Name the parts 1 to 5.

(b) What is contraception? List three advantages of adopting contraceptive measures



Heredity And Evolution

Q 1 Assertion (A) : The sex of a child in human beings will be determined by the type of chromosome he/she inherits from the father.
Reason (R) : A child who inherits 'X' chromosome from his father would be a girl (XX), while a child who inherits a 'Y' chromosome from the father would be a boy (XY).

Q 2 Write a difference between inherited traits and acquired traits giving one example of each

Q 3 Name the information source for making proteins in the cells.

Q 4
a) Why is the F_1 progeny always of tall plants when a tall plant is crossed with a short pea plant?
b) How is F_2 progeny obtained by self-pollination of F_1 progeny different from F_1 progeny? Give reason for this observation.
c) State a conclusion that can be drawn on the basis of this observation.

Q 5 A green stemmed rose plant denoted by GG and a brown stemmed rose plant denoted by gg are allowed to undergo a cross with each other.
(a) List your observations regarding :
(i) Colour of stem in their F_1 progeny
(ii) Percentage of brown stemmed plants in F_2 progeny if plants are self pollinated.
(iii) Ratio of GG and Gg in the F_2 progeny.
(b) Based on the findings of this cross, what conclusion can be drawn?

Q 6 "It is a matter of chance whether a couple will have a male or a female child." Justify this statement by drawing a flow chart

Q 7 How did Mendels experiments show that different traits are inherited independently?

Q 8 List two differences in tabular form between dominant trait and recessive traits. What percentage/proportion of the plants in the F2 generation/progeny were round, in Mendel's cross between round and wrinkled pea plants?

Q 9 "We cannot pass on to our progeny the experience and qualifications earned during our lifetime." Justify the statement giving reason and examples

Q10 Explain how sexual reproduction gives rise to more viable variations than asexual reproduction. How does this idea affect the evolution of organisms that reproduce sexually?

Q11 A blue colour flower plant denoted by BB is cross-bred with that of white colour flower plant denoted by bb.
a) State the colour of flower you would expect in their F_1 generation plants.
b) What must be the percentage of white flower plants in F_2 generation if flowers of F_1 plants are self-pollinated?
State the expected ratio of the genotypes BB and Bb in the F_2 progeny.

Q12 How do Mendels experiments show that
(a) traits may be dominant or recessive?
(b) inheritance of two traits is independent of each other?

Light (Reflection and Refraction)

Q 1 Draw a labelled ray diagram to show the path of the reflected ray corresponding to an incident ray of light parallel to the principal axis of a convex mirror. Mark the angle of incidence and angle of reflection on it

Q 2 An object is placed at a distance of 30 cm in front of a convex mirror of focal length 15 cm. Write four characteristics of the image formed by the mirror.

Q 3 The laws of reflection hold true for
(a) plane mirrors only (b) concave mirrors only (c) convex mirrors only (d) all reflecting surface

Q 4 Name the type of mirrors used in the design of solar furnaces. Explain how high temperature is achieved by this device

Q 5 List four characteristics of the images formed by plane mirrors

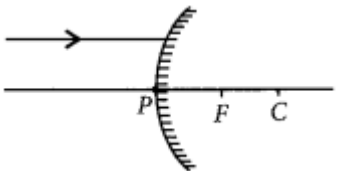
Q 6 With the help of a ray diagram state what is meant by refraction of light. State Snell's law for refraction of light and also express it mathematically.
The refractive index of air with respect to glass is 2/3 and the refractive index of water with respect to air is 4/3. If the speed of light in glass is 2×10^8 m/s, find the speed of light in
(a) air, (b) water.

Q 7 An object 4 cm in height, is placed at 15 cm in front of a concave mirror of focal length 10 cm. At what distance from the mirror should a screen be placed to obtain a sharp image of the object. Calculate the height of the image

Q 8 The image of a candle flame placed at a distance of 45 cm from a spherical lens is formed on a screen placed at a distance of 90 cm from the lens. Identify the type of

lens and calculate its focal length. If the height of the flame is 2 cm, find the height of its image.

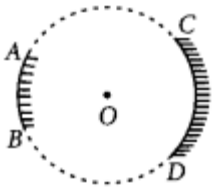
Q 9 **A ray of light is incident on a convex mirror as shown. Redraw the diagram and complete the path of this ray after reflection from the mirror. Mark angle of incidence and angle of reflection on it.**



Q10 **One half of a convex lens of focal length 10 cm is covered with a black paper. Can such a lens produce an image of a complete object placed at a distance of 30 cm from the lens? Draw a ray diagram to justify your**

Q11 **The linear magnification produced by a spherical mirror is $+\frac{1}{3}$. Analysing this value state the (i) type of mirror and (ii) position of the object with respect to the pole of the mirror. Draw any diagram to justify your answer.**

Q12 **AB and CD, two spherical mirrors, from parts of a hollow spherical ball with its centre at O as shown in the diagram. If arc AB = 12 arc CD, what is the ratio of their focal lengths? State which of the two mirrors will always form virtual image of an object placed in front of it and why?**



Q13
a) **What is meant by 'power of a lens?'**
b) **State and define the S.I unit of power of a lens.**
c) **A convex lens of focal length 25 cm and a concave lens of focal length 10 cm are placed in close contact with each other. Calculate the lens power of this combination.**

Q14
a) **A 5 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 20 cm. The distance of the object from the lens is 30 cm. Find the position, nature and size of the image formed.**
b) **Draw a labelled ray diagram showing object distance, image distance and focal length in the above case**

Q15 **A convex lens can form a magnified erect as well as magnified inverted image of an object placed in front of it". Draw ray diagram to justify this statement stating the position of the object with respect to the lens in each case. An object of height 4 cm is placed at a distance of 20 cm from a concave lens of focal length 10 cm. Use lens formula to determine the position of the image formed**

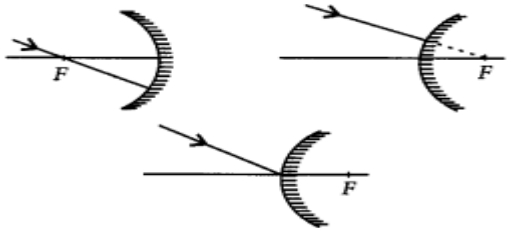
Q16 **The image formed by a spherical mirror is real, inverted and its magnification is -2. If the image is at a distance of 30 cm from the mirror, where is the object placed? Find the focal length of the mirror. List two characteristics of the image formed if the object is moved 10 cm towards the mirror.**

Q17
a) **Define focal length of a divergent lens.**
b) **A divergent lens has a focal length of 30 cm forms the image of an object of size 6 cm on the same side as the object at a distance of 15 cm from its optical centre. Use lens formula to determine the distance of the object from the lens and the size of the image formed.**
c) **Draw a ray diagram to show the formation of image in the above situation.**

Q18 **Draw a ray diagram in each of the following cases to show the formation of image, when the object is placed:**
(i) between optical centre and principal focus of a convex lens.
(ii) anywhere in front of a concave lens.
(iii) at 2F of a convex lens.

Q19 **What is the principle of reversibility of light? Show that the incident of light is parallel to the emergent ray of light when light falls obliquely on a side of a rectangular glass slab.**

Q20 **Draw the following diagram in which a ray of light is incident on a concave/convex mirror, on your answer sheet. Show the path of this ray, after reflection, in each case.**



Q21 A real image $\left(\frac{2}{3}\right)^{rd}$ of the size of an object is formed by a convex lens when the object is at a distance of 12 cm from it. Find the focal length of the lens.

Q22 A spherical mirror produces an image of magnification -1.0 on a screen placed at a distance of 30 cm from the pole of the mirror.
(i) Write the type of mirror in this case.
(ii) What is the focal length of the mirror?
(iii) What is the nature of the images formed?
(iv) Draw the ray diagram to show the image formation in this case

Q23 Mention the types of mirrors used as (i) rear view mirrors, (ii) shaving mirrors. List two reasons to justify your answer in each case.

Q24
a) Water has refractive index 1.33 and alcohol has refractive index 1.36. Which of the two medium is optically denser? Give reason for your answer.
b) Draw a ray diagram to show the path of a ray of light passing obliquely from water to alcohol.
c) State the relationship between angle of incidence and angle of refraction in the above case.

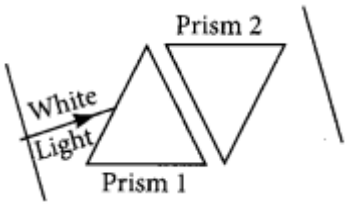
Q25 The absolute refractive indices of glass and water are $\frac{4}{3}$ and $\frac{3}{2}$ respectively. If the speed of light in glass is 2×10^8 m/s, calculate the speed of light in (i) vacuum, (ii) water.

Human Eye And Colourful World

Q 1 Define the term power of accommodation. Write the modification in the curvature of the eye lens which enables us to see the nearby objects clearly?

Q 2 State the function of each of the following parts of human eye:
(i) Cornea (ii) Iris (iii) Pupil

Q 3
a) State the relation between colour of scattered light and size of the scattering particle.
b) The apparent position of an object, when seen through the hot air, fluctuates or waves. State the basic cause of this observation.
c) Complete the path of white light when it passes through two identical prisms placed as shown



Q 4 (a) List two causes of hypermetropia.
(b) Draw ray diagrams showing
(i) a hypermetropic eye and (ii) its correction using suitable optical device

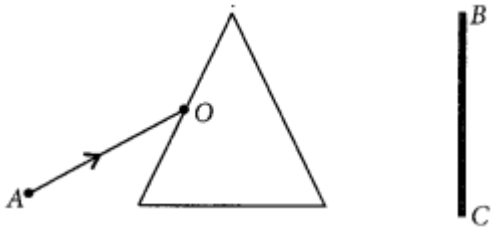
Q 5 With the help of a labelled diagram, explain why the sun appears reddish at the sun-rise and the sun-set.

Q 6 Person suffering from cataract has
(a) elongated eyeball (b) excessive curvature of eye lens
(c) weakened ciliary muscles (d) opaque eye lens

Q 7 What is atmospheric refraction? Use this phenomenon to explain the following natural events.
(a) Twinkling of stars
(b) Advanced sun-rise and delayed sun-set. Draw diagrams to illustrate your answers

Q 8 What will be the colour of the sky when it is observed from a place in the absence of any atmosphere?

Q 9
a) Trace on your answer sheet the path of a monochromatic ray AO incident on a glass prism and mark the angle of deviation.
b) If AO were a ray of white light,
i) describe what will you observe on the screen BC placed near the prism
ii) write the name of this phenomenon
iii) state the cause of this phenomenon
iv) what does it prove about the constituents of white light?



Q10 What eye defect is myopia? Describe with a neat diagram how this defect of vision can be corrected by using a suitable lens

Q11 Consider the following reasons for the reddish appearance of the sun at the sunrise or the sunset:

(A) Light from the sun near the horizon passes through thinner layers of air.
(B) Light from the sun covers larger distance of the earths atmosphere before reaching our eyes.
(C) Near the horizon, most of the blue light and shorter wavelengths are scattered away by the particles.
(D) Light from the sun near the horizon passes through thicker layers of air.
The correct reasons are

(i) A and C only (ii) B, C and D (iii) A and B only (iv) C and D only

Q12 Explain giving reason why the sky appears blue to an observer from the surface of the Earth. What should the appearance of the sky be during the day for an astronaut staying in the international space station orbiting the Earth? State reason to justify your answer

Q13 Give reasons:
(i) The extent of deviation of a ray of light on passing through a prism depends on the colour.
(ii) Lights of red colour are used for danger signals

Q14 (a) A person is suffering from both myopia and hypermetropia.
(i) What kind of lenses can correct this defect?
(ii) How are these lenses prepared?
(b) A person needs a lens of power +3 D for correcting his near vision and -3 D for correcting his distant vision. Calculate the focal lengths of the lenses required to correct these defects.

Q15 (a) What is dispersion of white light? State its cause.
(b) "Rainbow is an example of dispersion of sunlight." Justify this statement by explaining, with the help of a labelled diagram, the formation of a rainbow in the sky. List two essential conditions for observing a rainbow.

Q16 How will you use two identical glass prisms so that a narrow beam of white light incident on one prism emerges out of the second prism as white light? Draw and label the ray diagram

Q17 Draw a labelled diagram to explain the formation of a rainbow in the sky.

Q18 Draw a ray diagram to explain the term angle of deviation.

Q19 An old man cannot see objects closer than 1 m from the eye clearly. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagram for the
(i) defect of vision and also (ii) for its correction.

Q20 a) A person cannot read newspaper placed nearer than 50 cm from his eyes. Name the defect of vision he is suffering from. Draw a ray diagram to illustrate this defect. List its two possible causes. Draw a ray diagram to show how this defect may be corrected using a lens of appropriate focal length.
We see advertisements for eye donation on television or in newspapers. Write the importance of such advertisements.

Q21 b) A student is unable to see clearly the words written on the blackboard placed at a distance of approximately 4 m from him. Name the defect of vision the boy is suffering from. Explain the method of correcting this defect. Draw ray diagram for the (i) defect of vision and also (ii) for its correction

Q22 A student suffering from myopia is not able to see distinctly the objects placed beyond 5 m
a) List two possible reasons due to which this defect of vision may have arisen. With the help of ray diagrams, explain
(i) Why the student is unable to see distinctly the objects placed beyond 5 m from his eyes?
(ii) The type of the corrective lens used to restore proper vision and how this defect is corrected by the use of this lens.
If, in this case, the numerical value of the focal length of the corrective lens is 5 m, find the power of the lens as per the new Cartesian sign convention.

Electricity

Q 1 Define one ampere

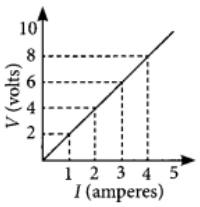
Q 2 If a person has five resistors each of value $\frac{1}{5}$ Ω, then the maximum and minimum resistance he can obtain by connecting them is _____.

Q 3 The resistance of a wire of 0.01 cm radius is 10 Ω. If the resistivity of the material of the wire is 50×10^{-8} ohm meter, find the length of the wire

Q 4 A wire has a resistance of 16 Ω. It is melted and drawn into a wire of half its original length. Calculate the resistance of the new wire. What is the percentage change in its resistance?

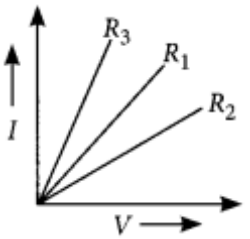
Q 5 Draw the symbols of commonly used components in electric circuit diagrams for
(i) An electric cell (ii) Open plug key (iii) Wires crossing without connection
(iv) Variable resistor (v) Battery (vi) Electric bulb (vii) Resistance

Q 6 Study the V-I graph for a resistor as shown in the figure and prepare a table showing the values of I (in amperes) corresponding to four different values V (in volts). Find the value of current for V = 10 volts. How can we determine the resistance of the resistor from this graph?



Q 7 A current of 10 A flows through a conductor for two minutes.
(i) Calculate the amount of charge passed through any area of cross section of the conductor.
(ii) If the charge of an electron is 1.6×10^{-19} C, then calculate the total number of electrons flowing.

Q 8 A student plots V-I graphs for three samples of nichrome wire with resistances R_1, R_2 and R_3. Choose from the following the statements that holds true for this graph.



(a) $R_1 = R_2 = R_3$
(b) $R_1 > R_2 > R_3$
(c) $R_3 > R_2 > R_1$
(d) $R_2 > R_1 > R_3$

Q 9
a) List the factors on which the resistance of a conductor in the shape of a wire depends.
b) Why are metals good conductors of electricity whereas glass is a bad conductor of electricity? Give reason.
c) Why are alloys commonly used in electrical heating devices?

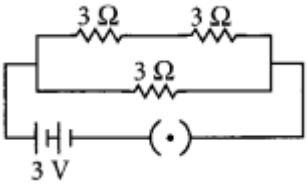
Q10 Assertion (A) : Alloys are commonly used in electrical heating devices like electric iron and heater.
Reason (R): Resistivity of an alloy is generally higher than that of its constituent metals but the alloys have low melting points then their constituent metals.

Q11 Assertion (A) : The metals and alloys are good conductors of electricity.
Reason (R) : Bronze is an alloy of copper and tin and it is not a good conductor of electricity.

Q12 A cylindrical conductor of length 'l' and uniform area of cross section 'A' has resistance 'R'. The area of cross section of another conductor of same material and same resistance but of length '2l' is_____.

Q13 List the advantages of connecting electrical devices in parallel with an electrical source instead of connecting them is series.

Q14 Three resistors of 3 Ω each are connected to a battery of 3 V as shown. Calculate the current drawn from the battery.



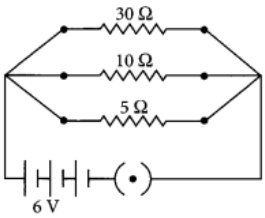
Q15 Show how would you join three resistors, each of resistance 9 Ω so that the equivalent resistance of the combination is (i) 13.5 Ω, (ii) 6 Ω

Q16 (a) Write the mathematical expression for Joules law of heating.
(b) Compute the heat generated while transferring 96000 coulomb of charge in two hours through a potential difference of 40 V.

Q17 (a) A 6 Ω resistance wire is doubled on itself. Calculate the new resistance of the wire.
(b) Three 2 Ω resistors A, B and C are connected in such a way that the total resistance

of the combination is 3 Ω. Show the arrangement of the three resistors and justify your answer

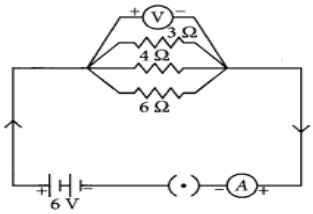
Q18 Two wires A and B are of equal length and have equal resistances. If the resistivity of A is more than that of B, which wire is thicker and why? For the electric circuit given below calculate:



(i) current in each resistor
(ii) total current drawn from the battery, and
(iii) equivalent resistance of the circuit.

Q19 Two identical resistors are first connected in series and then in parallel. Find the ratio of equivalent resistance in two cases

Q20 State ohms law. Represent it graphically. In the given circuit diagram calculate
(i) the total effective resistance of the circuit.
(ii) the current through each resistor.



Q21 Draw a schematic diagram of a circuit consisting of a battery of 3 cells of 2 V each, a combination of three resistors of 10 Ω, 20 Ω and 30 Ω connected in parallel, a plug key and an ammeter, all connected in series. Use this circuit to find the value of the following :
(a) Current through each resistor (b) Total current in the circuit
(c) Total effective resistance of the circuit

Q22 (a) Prove that the equivalent resistance of three resistors R_1, R_2 and R_3 in series is $R_1 + R_2 + R_3$
(b) You have four resistors of 8 Ω each. Show how would you connect these resistors to have effective resistance of 8 Ω?

Q23 How much current will an electric iron draw from a 220 V source if the resistance of its element when hot is 55 ohms? Calculate the wattage of the electric iron when it operates on 220 volts

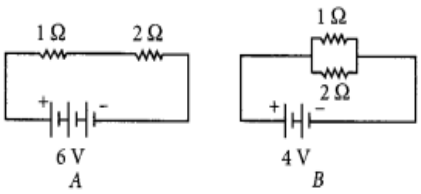
Q24 (a) Why is tungsten used for making bulb filaments of incandescent lamps?
(b) Name any two electric devices based on heating effect of electric current.

Q25 Explain the use of an electric fuse. What type of material is used for fuse wire and why?
A fuse wire melts at 5 A. If it is desired that the fuse wire of same material melt at 10 A, then whether the new fuse wire should be of smaller or larger radius than the earlier one? Give reasons for your answer.

Q26 (a) Define power and state its SI unit.
(b) A torch bulb is rated 5 V and 500 mA. Calculate its
(i) power (ii) resistance (iii) energy consumed when it is lighted for 2.5 hours

Q27 Two identical resistors, each of resistance 15 Ω, are connected in (i) series, and (ii) parallel, in turn to a battery of 6 V. Calculate the ratio of the power consumed in the combination of resistors in each case.

Q28 Compare the power used in 2 Ω. resistor in each of the following circuits.



Q29 a) How two resistors, with resistances R_1 Ω and R_1 Ω respectively are to be connected to a battery of emf V volts so that the electrical power consumed is minimum?
(b) In a house 3 bulbs of 100 watt each lighted for 5 hours daily, 2 fans of 50 watt each used for 10 hours daily and an electric heater of 1.00 kW is used for half an hour daily. Calculate the total energy consumed in a month of 31 days and its cost at the rate of Rs 3.60 per kWh

Q30 (i) State one difference between kilowatt and kilowatt hour. Express 1 kWh in joules.
(ii) A bulb is rated 5V; 500 mA. Calculate the rated power and resistance of the bulb when it glows

Q31 **A bulb is rated 40 W; 220 V. Find the current drawn by it, when it is connected to a 220 V supply. Also find its resistance. If the given bulb is replaced by a bulb of rating 25 W; 220 V, will there be any change in the value of current and resistance? Justify your answer and determine the change.**

Q32
a) **An electric bulb is connected to a 220 V generator. If the current drawn by the bulb is 0.50 A, find its power.**
b) **An electric refrigerator rated 400 W operates 8 hours a day. Calculate the energy per day in kWh.**
c) **State the difference between kilowatt and kilowatt hour**

Magnetic Effects of Electric Current

Q 1 **(a) What is an electromagnet? List any two uses.**
(b) Draw a labelled diagram to show how an electromagnet is made.
(c) State the purpose of soft iron core used in making an electromagnet.
(d) List two ways of increasing the strength of an electromagnet if the material of the electromagnet is fixed.

Q 2 **Draw magnetic field lines around a bar magnet. Name the device which is used to draw magnetic field lines.**

Q 3 **State the direction of magnetic field in the following case.**

Q 4 **Find the direction of magnetic field due to a current carrying circular coil held:**
i) **vertically in North – South plane and an observer looking it from east sees the current to flow in anticlockwise direction,**
ii) **vertically in East – West plane and an observer looking it from south sees the current to flow in anticlockwise direction,**
iii) **horizontally and an observer looking at it from below sees current to flow in clockwise direction**

Q 5 **What are magnetic field lines? Justify the following statements:**
(a) Two magnetic field lines never intersect each other. (b) Magnetic field are closed curves.

Q 6 **State whether an alpha particle will experience any force in a magnetic field if (alpha particles are positively charged particles)**
(i) it is placed in the field at rest.
(ii) it moves in the magnetic field parallel to field lines.
(iii) it moves in the magnetic field perpendicular to field lines.
Justify your answer in each case

Q 7 **State how the magnetic field produced by a straight current carrying conductor at a point depends on (a) current through the conductor (b) distance of point from conductor.**

Q 8 **Describe an activity with labelled diagram to show that a force acts on current carrying conductor placed in a magnetic field and its direction of current through conductor. Name the rule which determines the direction of this force.**

Q 9 **A compass needle is placed near a current carrying straight conductor. State your observation for the following cases and give reasons for the same in each case.**
(a) Magnitude of electric current is increased.
(b) The compass needle is displaced away from the conductor.

Q10 **(a) Draw a schematic diagram of a common domestic circuit showing provision of**
(i) Earth wire, (ii) Main fuse (iii) Electricity meter and (iv) Distribution box.
(b) Distinguish between short circuiting and overloading.

Q11 **Give reasons for the following:**
(a) It is dangerous to touch the live wire of the main supply rather than neutral wire.
(b) In household circuit, parallel combination of resistances is used.
(c) Using fuse in a household electric circuit is important.

Q12
(a) **State Right Hand Thumb rule to find the direction of the magnetic field around a current carrying straight conductor.**
(b) **How will the magnetic field be affected on:**
(i) increasing the current through the conductor
(ii) reversing the direction of flow of current in the conductor?

Q13 What is solenoid? Draw the pattern of magnetic field lines of
(i) a current carrying solenoid and (ii) a bar magnet.
List two distinguishing features between the two fields.

Q14 A current carrying conductor is placed in a magnetic field. Now answer the following.
(i) List the factors on which the magnitude of force experienced by conductor depends.
(ii) When is the magnitude of this force maximum?
(iii) State the rule which helps, in finding the direction of motion of conductor.
(iv) If initially this force was acting from right to left, how will the direction of force change if:
(a) direction of magnetic field is reversed? (b) direction of current is reversed?

Our Environment

Q 1 In the following food chain, plants provide 500 J of energy to rats. How much energy will be available to hawks from snakes? Plants → Rats → Snakes → Hawks

Q 2 Food web is constituted by
(a) relationship between the organisms and the environment
(b) relationship between plants and animals
(c) various interlinked food chains in an ecosystem
(d) relationship between animals and environment

Q 3 Why is the maximum concentration of pesticides found in human beings?

Q 4 What are decomposers? List two important roles they play in the environment.

Q 5 What is meant by biological magnification?

Q 6 In the following food chain, 100 J of energy is available to the lion. How much energy was available to the producers? Plants → Deer → Lion

Q 7 (a) What is an ecosystem? (b) List any two natural ecosystems.
(c) We do not clean ponds or lakes but an aquarium needs to be cleaned regularly. Why?

Q 8 (a) From the following group of organisms create a food chain which is most advantageous for human beings in terms of energy.
Hawk, Rat, Cereal plant, Goat, Snake, Human being
(b) State the possible disadvantage if the cereal plant is growing in soil rich in pesticides.
(c) Construct a food web using the organisms mentioned above.

Q 9 Write the full name of the group of compounds mainly responsible for the depletion of ozone layer.

Q10 How is ozone formed at the higher level of atmosphere?

Q11 "Energy flow in food chains is always unidirectional." Justify this statement.
Explain how the pesticides enter a food chain and subsequently get into our body.

Q12 What is ozone? How and where is it formed in the atmosphere? Explain how does it affect an ecosystem