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QUESTION BANK / प्रश्न बैंक

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CHAPTER 1 - CHEMICAL REACTIONS AND EQUATIONS

CH1-SECTION A - MCQ (1 MARKS)

1) **Sodium and chlorine are reacted, and as a result, sodium chloride is formed, which is also called table salt. What option gives the reactants and products of the reaction?**

(a) Reactants – sodium; products – chlorine

(b) Reactants – sodium and table salt; products – chlorine

(c) Reactants – tables salt; products – sodium and chlorine

(d) Reactants – sodium and chlorine; products – sodium chloride

Correct Answer: Option (d)

2.**Which of the following reaction can also be termed a thermal decomposition reaction?**

(a) Combination reaction

(b) Decomposition reaction

(c) Displacement reaction

(d) Double displacement reaction

Correct Answer: Option (b)

3.**A student performs an experiment to form aluminium chloride from aluminium and chlorine. Which of the following option gives the chemical equation of the reaction?**

(a) $Al + Cl_2 \rightarrow AlCl_2$

(b) $2Al + Cl_2 \rightarrow 2AlCl$

(c) $2Al + 3Cl_2 \rightarrow 2AlCl_3$

(d) $3Al + 3Cl_2 \rightarrow 3AlCl_3$

Correct Answer: Option (c)

4.**) A researcher adds barium hydroxide to hydrochloric acid to form a white-coloured barium chloride. Which of the following option gives the balanced chemical equation of the reaction?**

(a) $HCl + Ba(OH)_2 \rightarrow BaCl_2 + 2HOH$

(b) $2HCl + Ba(OH)_2 \rightarrow BaCl_2 + 2HOH$

(c) $2HCl + Ba(OH)_2 \rightarrow BaH_2 + 2HCl + O_2$

(d) $HCl + 2Ba(OH) \rightarrow 2BaCl_2 + 2HOH + O_2$

Correct Answer: Option (b)

5.**. One of the following processes does not involve a chemical reaction, that is:**

(a) Melting of candle wax when heated

(b) Burning of candle wax when heated

(c) Digestion of food in your stomach

(d) Ripening of banana

Correct Answer: Option (a)

6.) **What happens when lead nitrate reacts with potassium iodide?**

(a) They will not react

(b) A large amount of hydrogen will be released

(c) Yellow ppt of lead iodide and potassium nitrate will be produced

(d) Evolution of gas will occur

Correct Answer: Option ©

7**) Which of the following shows an oxidation reaction?**

(a) Gain of oxygen

(b) Loss of oxygen

(c) Gain of hydrogen

(d) None of the above

Answer: Option (a)

8)**The chemical reaction between potassium chloride and silver nitrate is given by the chemical equation,**

$AgNO_3 + KCl \rightarrow AgCl + KNO_3$.

What can be inferred from the chemical equation?

(a) Silver nitrate and potassium undergo a decomposition reaction to form silver chloride and potassium nitrate

(b) Silver nitrate and potassium undergo a displacement reaction to form silver chloride and potassium nitrate

(c) Silver nitrate and potassium undergo a combination reaction to form silver chloride and potassium nitrate

(d) Silver nitrate and potassium undergo a double displacement reaction to form silver chloride and potassium nitrate

Correct Answer: Option (d)

9.**) Which of the following reactions is used in black-and-white photography?**

(a) Combination Reaction

(b) Decomposition Reaction

(c) Displacement reaction

(d) Oxidation reaction

Correct Answer: Option (b)

10) . Magnesium ribbon is rubbed before burning because it has a coating of

(a) basic magnesium carbonate

(b) basic magnesium oxide

(c) basic magnesium sulphide

(d) basic magnesium chloride

Correct answer : option (a)

CH1-SECTION B - ASSERTION AND REASON QUESTIONS (1 MAR

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

Q.1. Assertion (A) : Decomposition of vegetable matter into compost is an example of exothermic reactions.

Reason (R) : Exothermic reaction are those reactions in which heat is evolved.

Q.2. Assertion (A) : When HCl is added to zinc granules, a chemical reaction occurs.
Reason (R) : Evolution of a gas and change in colour indicate that the chemical reaction is taking place.

Q.3. Assertion (A) : Calcium carbonate when heated gives calcium oxide and water.
Reason (R) : On heating calcium carbonate, decomposition reaction takes place.

Q.4. Assertion (A) : Brown fumes are produced when lead nitrate is heated.

Reason (R) : Nitrogen dioxide gas is produced as a by product due to the decomposition of lead nitrate.

Q.5. Assertion (A) : White silver chloride turns grey in sunlight.
Reason (R) : Decomposition of silver chloride in presence of sunlight takes place to form silver metal and chlorine gas.

Q.6. Assertion (A): Pungent smelling gas is produced when sulphur burns in air.
Reason (R) : Sulphur trioxide is formed on reaction of sulphur with oxygen.

Q.7. Assertion (A) : In a reaction of copper with oxygen, copper serves as a reducing agent.
Reason (R) : The substance which gains oxygen in a chemical reaction acts as a reducing agent.

Q.8. Assertion (A) : In electrolysis of water, the volume of hydrogen liberated is twice the volume of oxygen formed.
Reason (R) : Water (H,0) has hydrogen and oxygen in the ratio of 1:2 by volume.

Q.9. Assertion (A): Corrosion of iron is commonly known as rusting.
Reason (R) : Corrosion of iron occurs in presence of water and air.

Q.10. Assertion (A) : The balancing of chemical equations is based on law of conservation of mass.
Reason (R) : Total mass of reactants is equal to total mass of products.

CH1-SECTION C1 - SHORT ANSWER QUESTIONS (2 MARKS)

1. Why a combustion reaction an oxidation reaction?

Answer: Combustion reaction because it is always carried out in the presence of air or oxygen for e.g.

CH_4 (g) + $2O_2$ (g) Co_2 (g) +$2H_2O$ (l)

2. Explain the significance of photosynthesis.

Write the balanced chemical equation involved in the process. (Board Term I, 2017)

Answer:

Photosynthesis means synthesis with the help of light. It is the process that gives life to all living beings.

Photosynthesis is a process by which plants utilize carbon dioxide and water in the presence of sunlight to produce glucose and oxygen.

$$6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \underset{\text{Glucose}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$$

3. 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.

Answer.Yellow precipitate of lead iodide is formed. It is precipitation reaction.

$Pb(NO_3)_2$ (aq) + 2KI (aq) —-> PbI_2 (s) + $2KNO_3$ (aq)

It is also called double displacement reaction.

4. Why do we store silver chloride in dark-coloured bottles?

Answer: 2AgCl 2Ag + Cl2

Silver chloride decomposes into silver & chlorine gas when exposed to light. Dark-coloured bottles interrupt the path of light such that light cannot reach silver chloride in the bottles, and its decomposition is prevented.

5. 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.

Answer:

(i) A is calcium oxide, CaO which is used in the manufacturing of cement.

B is calcium hydroxide $Ca(OH)_3$.

(ii) $\underset{(A)}{CaO_{(s)}} + H_2O_{(l)} \longrightarrow \underset{(B)}{Ca(OH)_{2(s)}}$

CH1-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

1. 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

1. $H_2(g) + Cl_2(g) \rightarrow 2HCl\ (g)$
2. $Pb(s) + CuCl_2\ (aq) \rightarrow PbCl_2\ (aq) + Cu(s)$
3. $ZnO(s) + C(s) \rightarrow Zn\ (s) + CO(g)$

2. Write one equation each for decomposition reactions in which energy is supplied in the form of heat, light or electricity.

(a) Thermal decomposition reaction (Thermolysis)

Decomposition of potassium chlorate: If heated strongly, potassium chlorate decomposes

into potassium chloride and oxygen molecules. This reaction is commonly used for the synthesis of oxygen molecules.

$2KClO_3 + heat \rightarrow 2KCl + 3O_2$

(b) Electrolytic decomposition reaction (Electrolysis)-

Decomposition of sodium chloride NaCl: On passing electricity through molten sodium chloride NaCl, it decomposes into sodium and chlorine.

$2NaCl$—- $2Na + Cl_2$ (in Electrolysis)

(c) Photodecomposition reaction (Photolysis)

Decomposition of Hydrogen peroxide- In the presence of light, hydrogen peroxide decomposes into water and oxygen molecules.

$2H_2O_2 + light \longrightarrow H2O + O2$

3. A substance X, an oxide of a group 2 element, is used intensively in the cement industry. This element is present in bones also. On treatment with a water solution, it forms a solution which turns red litmus to blue. Identify X and further write the chemical reactions involved.

Compound X is Calcium oxide. CaO is extensively utilised in the cement industry. On treatment with water, CaO produces calcium hydroxide $Ca(OH)_2$, which is alkaline and turns red litmus into blue colour.

$CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq)$

Explanations: Calcium is an element of group 2 and is present here in bones, also. Calcium oxide, generally known as quicklime, is used intensively in the cement industry. Calcium, on treatment with water, forms alkaline calcium hydroxide, which turns the red litmus to blue.

4. Why are decomposition reactions called the opposite of combination reactions? Write equations for decomposition reactions.

A combination reaction is said to be the reaction between two or more molecules to form a larger molecule. A decomposition reaction is defined as splitting large molecules into two or smaller molecules. It explains that the decomposition reaction is the opposite of the combination reaction.
In most cases, the decomposition reaction is endothermic since the heat from the surrounding or induced heat is used to diffuse the bonds of the larger molecule. Some examples of decomposition reactions are

$ZnCO_3 \rightarrow ZnO + CO_2$

$CaCO_3 + Energy \rightarrow CaO + CO_2$

$2HgO \rightarrow 2Hg + O_2$

Explanations: In a decomposition reaction, a single substance breaks down into two or more substances, while in a combination reaction, two or more substances react to produce one substance. Therefore, decomposition reactions are called the opposite of combination reactions.

5. Explain the following topics with one example each.

(a) Corrosion (b) Rancidity

(a) Corrosion is a slow process where a refined metal atom is oxidised by atmospheric oxygen to create a more stable compound, like oxides. The metal atom gradually degrades during the corrosion process. Rusting of iron is an important example of corrosion where the iron is converted to Iron

oxide. Millions of pounds are spent annually to prevent bridges and other monuments from rusting.

(b) Rancidity: The condition produced by the aerial oxidation of the oil and fat in the food material has an unpleasant taste and odour. The rancidity is retarded if the food is kept inside the refrigerator since the low temperature does not promote the oxidation reaction.

Explanations: Corrosion is a reaction where a metal reacts with water, air or acid to form oxides and carbonates. It is also known as rust. For example, black coating on silver in the presence of air or atmosphere. Rancidity is the oxidation process of fats and oils when kept in the open or in the presence of oxygen for a long time. Due to this, changes in taste and odour of food can be observed. To prevent rancidity, food items are flushed with nitrogen or kept in airtight containers. For example, the taste and smell of butter change when held for a long time.

CH1-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

Q.1. A chemical reaction is a representation of chemical change in terms of symbols and formulae of reactants and products. There are various types of chemical reactions like combination, decomposition, displacement, double displacement, oxidation and reduction reactions. Reactions in which heat is released along with the formation of products are called exothermic chemical reactions. All combustion reactions are exothermic reactions.

(i) The massive force that pushes the rocket forward through space is generated due to the

(a) combination reaction

(b) decomposition reaction

(c) displacement reaction

(d) double displacement reaction

(ii) A white salt on heating decomposes to give brown fumes and yellow residue is left behind. The yellow residue left is of

(a) lead nitrate

(b) nitrogen dioxide

(c) lead oxide

(d) oxygen gas

(iii) Which of the following reactions represents a combination reaction?

(a) $CaO\ (s) + H_2O\ (l) \rightarrow Ca\ (OH)_2\ (aq)$

(b) $CaCO_3\ (s) \rightarrow CaO\ (s) + C\ O_2(g)$

(c) $Zn(s) + CuSO_4\ (aq) \rightarrow ZnSO_4\ (aq) + Cu(s)$

(d) $2FeSO_4(s) \rightarrow Fe_2O_3\ (s) + SO_2(g) + SO_3(g)$

(iv) Complete the following statements by choosing correct type of reaction for X and Y.

Statement 1: The heating of lead nitrate is an example of ‘X’ reaction.

Statement 2: The burning of magnesium is an example of ‘Y’ reaction.

(a)X-Combination,Y-Decomposition

(b)X-Decomposition,Y-Combination

(c)X-Combination,Y-Displacement

(d) X- Displacement, Y-Decomposition

Amswer: I) b ii) c Iii) a Iv) b

1. Those reactions in which two compounds react by an exchange of ions to form two new compounds are called double displacement reactions. A double displacement reaction usually occurs in solution and one of the products, being insoluble, precipitate out (separates as a solid). Any reaction in which an insoluble solid (called precipitate) is formed that separates from the solution is called a precipitation reaction. The reaction in which acid or acidic oxide reacts with base or basic oxide to form salt and water is called neutralisation reaction.

(i) 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

(ii) Barium chloride on reaction with ammonium sulphate forms barium sulphate and ammonium chloride. Which of the following correctly represents the type of the reaction involved?

(I) Displacement reaction

(II) Precipitation reaction

(III) Combination reaction

(IV) Double displacement reaction

(a) (I) only

(b) (II) only

(c) (III) and (IV) only

(d) (II) and (V) only

(iii) Identify A in the following reaction.

$AlCl_3(aq) + 3NH_4OH(aq) \rightarrow A + 3NH_4Cl(aq)$

(a) Al (OH)3

(b) Al2 O3

(c) AlH3

(d) AlN

(iv) Consider the following reaction, $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$. Identify the precipitate in the reaction,

(a) BaCl2

(b) BaSO4

(c) Na2SO4

(d) NaCl

2.i) (d) ii) (d) iii) (a) iv) (b)

Q.2 CASE STUDY QUESTIONS

1. Why a combustion reaction an oxidation reaction?
Answer: Combustion reaction because it is always carried out in the presence of air or oxygen for e.g.
$CH_4(g) + 2O_2(g) \longrightarrow Co_2(g) + 2H_2O(l)$

2. Explain the significance of photosynthesis.
Write the balanced chemical equation involved in the process. (Board Term I, 2017)
Answer:
Photosynthesis means synthesis with the help of light. It is the process that gives life to all living beings.

Photosynthesis is a process by which plants utilize carbon dioxide and water in the presence of sunlight to produce glucose and oxygen.

$$6CO_2 + 12H_2O \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \underset{\text{Glucose}}{C_6H_{12}O_6} + 6O_2 + 6H_2O$$

3. 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.

Answer.Yellow precipitate of lead iodide is formed. It is precipitation reaction.

$Pb(NO_3)_2$ (aq) + 2KI (aq) —-> PbI_2 (s) + $2KNO_3$ (aq)

It is also called double displacement reaction.

4. Why do we store silver chloride in dark-coloured bottles?

Answer: 2AgCl 2Ag + Cl2

Silver chloride decomposes into silver & chlorine gas when exposed to light. Dark-coloured bottles interrupt the path of light such that light cannot reach silver chloride in the bottles, and its decomposition is prevented.

5. 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.

Answer:

(i) A is calcium oxide, CaO which is used in the manufacturing of cement.

B is calcium hydroxide $Ca(OH)_3$.

(ii) $\underset{(A)}{CaO_{(s)}} + H_2O_{(l)} \longrightarrow \underset{(B)}{Ca(OH)_{2(s)}}$

CH1-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Q1. Design an activity to demonstrate the

decomposition reaction of lead nitrate.

(b) Draw labelled diagram of the experimental set up. List two main observations.

(c) Write balanced chemical equation for the reaction

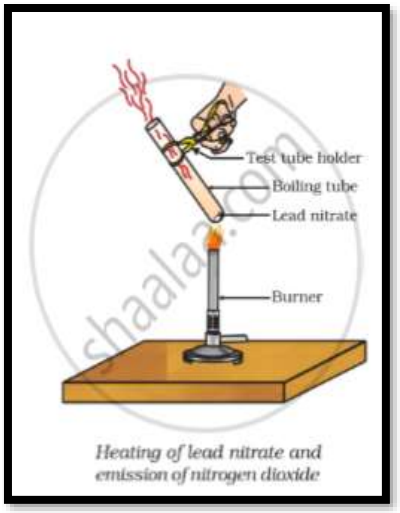
stating the physical state of the reaction and the products.

Ans :

(a) Take a small amount of lead nitrate powder in a boiling tube.

Hold the boiling tube with a pair of tongs and heat it over the flame first gently and then strongly.

(b) Labeled diagram of the experimental setup :



Heating of lead nitrate and emission of nitrogen dioxide

Two main observations :

(i) We observe emission of brown fumes of a gas which is nitrogen dioxide.

(ii) The white colour of lead nitrate changes to yellow colour as lead oxide is formed.

(c) Balanced equation :

$2\ Pb(NO_3)_2\ (s) \longrightarrow PbO(s) + 4NO_2(g) + O_2(g)$

Q2. State one characteristic each of the chemical reaction which takes place when :

(i) dilute hydrochloric acid is added to sodium carbonate

(ii) lemon juice is added gradually to potassium permanganate solution

(iii) dilute sulphuric acid is added to barium chlorid solution

(iv) quicklime is treated with water

(v) wax is burned in the form of a candle

Ans:
(i) When sodium carbonate is added to dilute hydrochloric acid, carbon dioxide gas evolves. Hence, this reaction is characterised by evolution of gas.

(ii) Lemon juice (contains citric acid) changes the purple colour of potassium permanganate solution to a colourless solution. Hence, this reaction is characterised by change in colour.

(iii) When dilute sulphuric acid is added to barium chloride solution, it forms white precipitates of barium sulphate. Hence, this reaction is characterised by formation of precipitate.

(iv) When quicklime is treated with water, slaked lime is formed with the evolution of large amount of heat. Hence, this reaction is characterised by change in temperature.

(v) When wax (solid) is burnt in the form of candle, it produces water (liquid) and carbon dioxide (gas). Hence, this reaction is characterised by change in state

Q3.Give one example each of a chemical reaction characterised by

1. Evolution of a gas.
2. Change in colour.
3. Formation of a precipitate.
4. Change in temperature.
5. Change in state.

Ans:
1. Evolution of gas:
The chemical reaction between zinc and dilute sulphuric acid is characterized by the evolution of

hydrogen gas.

$Zn(s) + H_2SO_4(aq) \text{-------} > ZnSO_4(aq) + H_2(g)$

2. Change in colour:

The reaction between lead nitrate solution and potassium iodide solution.

$Pb(NO_3)_2(aq) + 2KI \text{-------} > PbI_2(s) + 2KNO_3(aq)$

In this reaction colour changes from colourless to yellow.

3. Formation of precipitate:

The action of barium chloride on sodium sulphate.

$BaCl_2(aq) + Na_2SO_4(aq) \text{------} > BaSO_4(s) + 2NaCl(aq)$

4. Change in temperature:

The action of dilute sulphuric acid on zinc.

$Zn(s) + H_2SO_4(aq) \text{--------} > ZnSO_4(s) + H_2(g)$

In this reaction, heat is evolved.

5. Change in the state:

When wax is burnt in the form of the wax candle, then water and carbon dioxide are formed. Wax is solid, water is a liquid whereas carbon dioxide is a gas.

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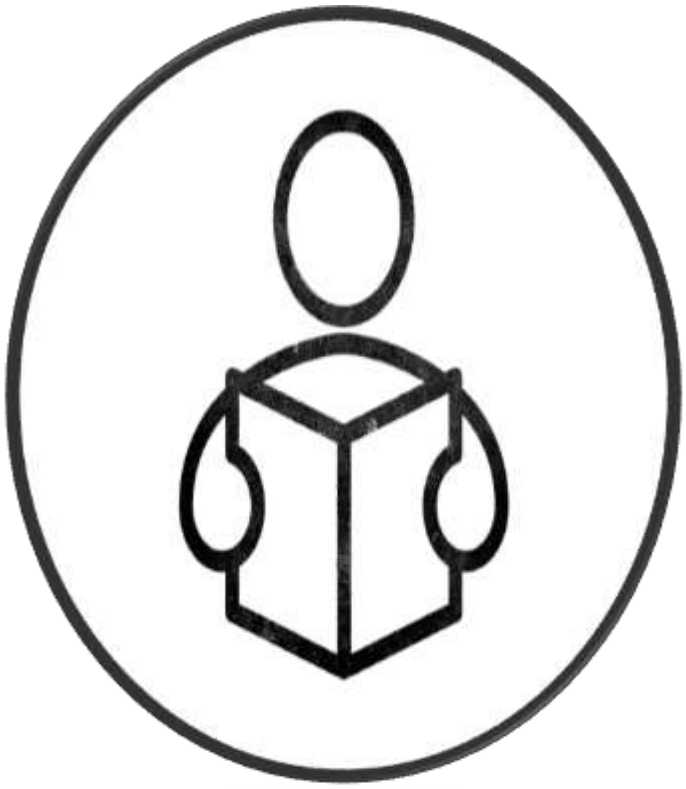

CHAPTER 2 - ACIDS, BASES AND SALTS

CH2-SECTION A - MCQ (1 MARKS)

Q.1 Which solution will change blue litmus to red?

(a) NaOH(aq)

(b) H_2SO_4 (aq)

(c) KCl (aq)

(d) NH_4OH(aq)

Answer (b)

Q.2 Human body works within the pH range of

(a) 7.0 to 7.8

(b) 4.5 to 5.6

(c) 13.0 to 14.0

(d) 1.2 to 2.2

Answer (a)

Q.3 Calcium carbonate is the chemical formula of

(a) limestone

(b) chalk

(c) marble

(d) all (a), (b) and (c)

Answer (d)

Q.4 The chemical formula of caustic potash is

(a) NaOH

(b) $Ca(OH)_2$

(c) NH_4OH

(d) KOH

Answer d) KOH

Q.5 Which of the following is taken orally as medicine in the case of hyperacidity to get relief?

(a) Sodium hydroxide

(b) Calcium hydroxide

(c) Milk of sodium

(d) Milk of magnesia

Answer (D)

Q.6 Lime water is

(a) CaO

(b) Ca(OH)2

(c) CaCO3

(d) CaCI2

Answer (b) Ca(OH)2

Q.7 Which of the following gas if formed when an acid reacts with metal carbonate?

(a) Carbon monoxide

(b) Carbonic acid gas

(c) Carbon dioxide gas

(d) Hydrochloric acid gas

Answer (c) Carbon dioxide gas

Q.8 Which of the following acid is also known as vinegar?

(a) Dilute hydrochloric acid

(b) Dilute sulphuric acid

(c) Dilute acetic acid

(d) Dilute tartaric acid

Answer (c) Dilute acetic acid

Q.9 What happens when excess of carbon dioxide gas is passed through lime water?

(a) Lime water first turns milky and then colourless

(b) Lime water turns bluish

(c) Lime water turns milky

(d) Lime water turns blackish

Answer (a) Lime water first turns milky and then collarless

Q.10 1. A basic solution could have a pH of

(a) 1

(b) 11

(c) 7

(d) 2

Answer (b)

Q.11Calcium phosphate is present in tooth enamel. Its nature is

(a) basic

(b) acidic

(c) neutral

(d) amphoteric

Answer:

(a). $Ca_3(PO_4)_2$ is a salt of strong base $Ca(OH)_2$ and weak acid H_3PO_4.

Q.12 Common salt besides being used in kitchen can also be used as the raw material for making

(i) washing soda

(ii) bleaching powder

(iii) baking soda

(iv) slaked lime

(a) (i) and (ii)

(b) (i), (ii) and (iv)

(c) (i) and (iii)

(d) (i), (iii) and (iv)

Answer: (c).

CH2-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS)

The following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

(a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.

(c) If Assertion is correct but Reason is incorrect.

(d) If Assertion is incorrect but Reason is correct

Q1. Assertion: While dissolving an acid or base in water, the acids must always be added slowly to water with constant stirring.
Reason: Dissolving an acid on a base in water is a highly exothermic reaction

---

Q2. Assertion: Phenolphthalein gives pink color in the basic solution.
Reason: Phenolphthalein is a natural indicator.

Q3. Assertion: HCl gas does not change the color of dry blue litmus paper.
Reason: HCl gas dissolves in the water present in wet litmus paper to form H+ ions

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Q4. Assertion: H_2CO_3 is a strong acid.
Reason: A strong acid dissociates completely or almost completely in water

---

Q5. Assertion: Sodium hydroxide reacts with zinc to produce hydrogen gas.
Reason: Acids react with active metals to produce hydrogen gas.

Q6. Assertion: Salts are the products of an acid-base reaction.
Reason: Salt may be acidic or basic

Q7. Assertion: Ammonia solution is an alkali.
Reason: Ammonia solution turns blue litmus paper red.

Q8. Assertion: Weak acids have low electrical conductivity.
Reason: Strong acids and weak acids have equal concentration of hydrogen ions in their solutions

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Q9. Assertion: Baking soda creates acidity in the stomach.
Reason: Baking soda is alkaline.

Q10.Assertion: During electrolysis of a concentrated aqueous solution of sodium chloride, hydrogen is produced at the anode and chlorine gas is produced at the cathode.
Reason: Ions get attracted to oppositely charged electrodes.

CH2-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

6. Complete and balance the following chemical equations :

(i) $NaOH(aq) + Zn(s) \rightarrow$

(ii) $CaCO_3(s) + H_2O(l) + CO_2(g) \rightarrow$

(iii) $HCl(aq) + H_2O(l) \rightarrow$

ANSWER -(i) $2NaOH(aq) + Zn(s) \rightarrow Na_2ZnO_2(aq) + H_2(g)$

(ii) $CaCO_3(s) + CO_2(g) + H_2O(l) \rightarrow Ca(HCO_3)_2(aq)$

(iii) $HCl(aq) + H_2O(l)$ $H_3O^+ Cl^-_{(aq)}$

7. (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.

ANSWER- (a) (i) The solution having lower pH will have more hydrogen ion concentration. Hence, solution 'A' will have highest H^+ ion concentration.

(ii) Solution CC' i.e., pH = 5 has the lowest concentration of H^+ ions.

(b) Mixing of an acid with water is called dilution. This process is highly exothermic and therefore, acid is always added to the water not water to acid. The process for diluting concentrated sulphuric acid is :

(i) Take about 10 mL of water in a beaker.

(ii) Add concentrated sulphuric acid dropwise to water and swirl the beaker slowly.

8. 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.

ANSWER (i) Only one half of water molecule is shown in the formula of plaster of Paris ($CaSO_4$. ½ H_2O) as one molecule of water is being shared by two molecules of calcium sulphate ($CaSO_4$). So the effective water of crystallisation for one $CaSO_4$ unit comes to half molecule of water.

(ii) Acidity can be neutralised by a base. Sodium hydrogen carbonate can be used as an antacid solution because it is a weak base and will react

with excess acid produced in the stomach due to hyperacidity and will neutralise it.

(iii) Blue coloured copper sulphate crystals are hydrated copper sulphate, $CuSO_4.5H_2O$. On heating blue copper sulphate crystals looses its water of crystallisation and turns into anhydrous copper sulphate which is white in colour.

9. 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?

ANSWER - Oxides of non-metals react with bases to form salt and water. For example, the reaction between carbon dioxide and calcium hydroxide. Calcium hydroxide, which is a base, reacts with carbon dioxide to produce salt and water.

$$\underset{\text{Carbon dioxide}}{CO_2} + \underset{\text{Calcium hydroxide}}{Ca(OH)_2} \longrightarrow \underset{\text{Calcium carbonate}}{CaCO_3} + H_2O$$

Hence, oxides of non-metals are acidic in nature.

10. 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.

ANSWER -(i) When CO_2 is passed through lime water for short interval of time, it turns milky due to the formation of insoluble calcium carbonate.

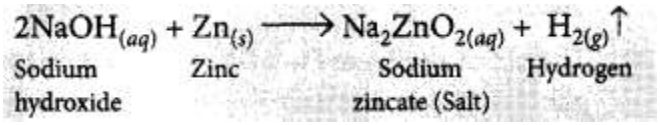
$$\underset{\text{Calcium hydroxide (Lime water)}}{Ca(OH)_{2(aq)}} + \underset{\text{Carbon dioxide}}{CO_{2(g)}} \longrightarrow \underset{\text{Calcium carbonate (White ppt.)}}{CaCO_{3(s)}\downarrow} + \underset{\text{Water}}{H_2O_{(l)}}$$

(ii) If CO_2 is passed for long duration through lime water, the white precipitate formed dissolves due to the formation of soluble calcium hydrogen carbonate and the solution becomes clear.

$$\underset{\text{Calcium carbonate (insoluble)}}{CaCO_{3(s)}} + \underset{\text{Carbon dioxide}}{CO_{2(g)}} + \underset{\text{Water}}{H_2O_{(l)}} \longrightarrow \underset{\text{Calcium hydrogen carbonate (soluble)}}{Ca(HCO_3)_{2(aq)}}$$

11. 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.

ANSWER -It is observed that active metals like zinc react with strong bases like NaOH, KOH etc. to liberate hydrogen gas and corresponding salt.

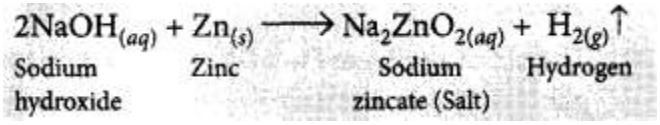


The evolution of gas is confirmed by the bubble formation in soap solution.

Test to detect H_2 gas: When burning matchstick is kept on the mouth of this test tube, pop sound is heard which confirms the presence of H_2 gas. When Zn metal reacts with dilute solution of strong acid, H_2 gas is evolved.

12. Write the names of the product formed when zinc reacts with NaOH. Also write the balanced chemical equation for the reaction involved. Write a test to confirm the presence of the gas evolved during this reaction.

ANSWER -It is observed that active metals like zinc react with strong bases like NaOH, KOH etc. to liberate hydrogen gas and corresponding salt.



The evolution of gas is confirmed by the bubble formation in soap solution.

Test to detect H_2 gas: When burning matchstick is kept on the mouth of this test tube, pop sound is heard which confirms the presence of H_2 gas. When Zn metal reacts with dilute solution of strong acid, H_2 gas is evolved.

13. To a solution of sodium hydroxide in a test tube, two drops of phenolphthalein are added.

(i) State the colour change observed.

(ii) If dilute HCl is added dropwise to the solution, what will be the colour change?

(iii) On adding few drops of NaOH solution to the above mixture the colour of the solution reappears. Why?

ANSWER -(i) On adding phenolphthalein to NaOH solution, the colour becomes pink.
(ii) On adding dilute HCl solution dropwise to the same test tube, the pink colour disappears and the solution again becomes colourless.
(iii) On again adding NaOH to the above mixture, pink colour reappears because the medium becomes basic again.

14. 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.

ANSWER -Onion juice is an olfactory indicator. Olfactory indicators give one type of odour in acidic medium and a different odour in basic medium. As the liquid 'X' turns blue litmus red, hence it is an acidic solution.
(a) Acids react with active metals such as zinc, magnesium etc. and evolve hydrogen gas, for example,
$Zn_{(s)}$ dil.$H_2SO_{4(aq)} \rightarrow ZnSO_4H_{2(g)}$
(b) Acids react with metal carbonates to give carbon dioxide with brisk effervescence.

15. (a) Write the chemical name and formula of marble.

(b) It has been found that marbles of Taj are getting corroded due to development of industrial areas around it. Explain this fact giving a chemical equation.

(c) (i) What happens when CO_2 is passed through lime water?

(ii) What happens when CO_2 is passed in excess through lime?

ANSWER -(a) The chemical formula of marble (lime stone) is $CaCO_3$. Its chemical name is calcium carbonate.
(b) Taj Mahal, one of the seven wonders of the world situated at Agra, is continuously losing its luster day by day due to rapid industrialisation which causes acid rain.
The sulphuric acid present in the acid rain causes the marble ($CaCO_3$) to be washed off as calcium sulphate ($CaSO_4$), leading to the deterioration of such a splendid piece of architecture.
$CaCO_{3(s)} + H_2SO_{4(aq)} \rightarrow CaSO_{4(aq)} + H_2O_l + CO_{2(g)}$

(c) When excess CO_2 is added, it reacts with calcium carbonate($CaCO_3$) and water (H_2O) to form calcium bicarbonate $Ca(HCO_3)_2$ and since it is soluble in water, it dissolves in it making the solution clear again. The chemical reaction is as follows:

$CaCO_3 + CO_2 + H_2O$ ---------> $Ca(HCO_3)_2$.

CH2-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

Short answer type questions

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?

Ans: Oxides of non-metals react with bases to form salt and water. For example, the reaction between carbon dioxide and calcium hydroxide. Calcium hydroxide, which is a base, reacts with carbon dioxide to produce salt and water. Hence, oxides of non-metals are acidic in nature.

2. A doctor applied surgical bandages on the fractured bones of a patient after making it wet. What changes are likely to occur?

Ans: Surgical bandages are made from plaster of Paris. When applied on the fractured bones after making them wet , it changes into a hard mass called Gypsum.

$CaSO_4.1/2\ H_2O + 3/2\ H_2O$------- $CaSO_4.2H_2O$

3. Fresh milk has a pH of 6. When it changes to curd, will its pH value increase or decrease? Why?

Ans- When fresh milk changes to curd, the pH of the solution is likely to decrease. Actually, lactose present in milk gets converted to lactic acid when curd is formed from milk. Therefore, the medium becomes more acidic and its pH decreases

4. On diluting an acid, it is advised to add acid to water and not water to acid. Explain why it is so advised?

Ans: Diluting a concentrated acid with water is a highly exothermic process. So, when water is added to concentrated acid, large amounts of heat is liberated which changes some water to steam explosively which can splash the acid and even the glass apparatus may break due to excessive heating.

5. Sodium hydrogen carbonate is a basic salt". Justify the statement. How is it converted into washing soda?

Explain.

Answer- .Sodium hydrogen carbonate is a salt of sodium hydroxide (strong base) and carbonic acid (weak acid).

It is basic salt. It is converted into washing soda by heating followed by crystallization.

CH2-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

I) A pH meter is a scientific instrument that measures the hydrogen-ion activity in water-based solution water- based solutions, indicating its acidity or alkalinity, expressed as pH. The pH meter measures the difference in electrical potential between a pH electrode and a reference electrode, and so the pH meter is sometimes referred to as a "potentiometric pH meter". The difference in electrical potential relates to the acidity or pH of the solution. The pH meter is used in many applications ranging from laboratory experimentation to quality

1. Which of the following statement is correct regarding pH Scale?

(i) It is the negative logarithm of H+ ion concentration of a given solution,

(ii) It is the positive logarithm of H+ ion concentration of a given solution.

(iii) It is a 14 point scale.

(iv) pH is an example of an extrinsic property.

Correct Options are:

A. (i) and (iii)

B. (ii) and (iii)

C. (i), (iii) and (iv)

D. Only (ii)

2. What is the neutral value of pH scale?

A. Less than 5

B. Equal to 7

C. Less than 8

D. Less than 10

3. In which of the following field pH scale is important for measurements?

A. Medicine

B. Forestry

C. Food Science

D. All of the above

4. What is the pH value of very strong acid solution?

A. Less than 7

B. Less than 5

C. Less than 10

D. Less than 2

Answer I) 1. (c) 2. (b) 3. (d). 4. (d)

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

1 Which of the following does not form an acidic salt?

a) Phosphoric acid

b) Carbonic acid

c)Hydrochloric acid

d) Sulphuric acid

2 Which of the following salts has no water of crystallization?

a) Copper sulphate

b) Washing soda

c)Baking soda

d) Gypsum

3. The formula of baking soda is

a) NaCl

b) KHCO3

c) NaHCO3

d) Na_2CO_3

4. Which of the following is treated with chlorine to obtain bleaching powder

a) Ca SO_4

b) Ca $(OH)_2$

c) Mg $(OH)_2$

d) KOH

Answers II

i) B ii) C iii) C iv) B

CH2-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Q1. A metal carbonate X reacting with acid gives a gas which, when passed through a solution Y, gives the carbonate back. On the other hand, a gas G obtained at the anode during electrolysis of brine is passed on dry Y, and it gives a compound Z, used for disinfecting drinking water. Identity X, Y, G and Z.

Ans:
X is showing calcium. When calcium carbonate interacts with HCl, it gives out CO_2 gas.

$CaCO_3 + 2HCl \rightarrow CaCl_2 + CO_2 + H_2O$

When carbon dioxide CO_2 is passed into lime water, it turns milky due to the formation of Calcium carbonate.

$CO_2 + Ca(OH)_2 \rightarrow CaCO_3 + H_2O$ white ppt calcium carbonate

Thus, solution Y shows lime water

If chlorine gas is passed on dry lime water, it gives bleaching powder used to disinfect water.

$2NaCl + 2H_2O \rightarrow 2NaOH + H_2 + Cl_2$

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

Hence, the metal carbonate X is $CaCO_3$, and Solution Y is lime water [$Ca(OH)_2$], gas G is chlorine (Cl_2), Y is dry slaked lime [$Ca(OH)_2$], Z is bleaching powder ($CaOCl_2$).

Q2. What is water of crystallization? Write the common name and chemical formula of a commercially important compound which has ten water molecules as water of crystallization. How is this compound obtained? Write the chemical equation also. List any two uses of this compound.

Ans:
Water of crystallization : Crystals of some salts contain certain amount of associated water.
The water associated with the crystal (or molecule) of any salt is called water of crystallisation.
The hydrated salt is known as washing soda which is sodium carbonate containing 10 molecules of water of crystallization, i.e., it is sodium carbonate decahydrate. Its molecular formula is $Na_2CO_3.10H_2O$.
It can be obtained by heating baking soda followed by recrystallisation from its aqueous solution.
Acids Bases and Salts Class 10 Important Questions with Answers Science Chapter 2 Img 29
Uses of sodium carbonate:
(i) For the manufacture of glass, soap, papers and chemicals like caustic soda (NaOH), borax, etc.
(ii) For washing purposes (laundry works).

Q3. Identify the acid and the base whose combination forms the common salt that you use in your food. Write its formula and chemical name of this salt. Name the source from where it is obtained.
(b) What is rock salt? Mention its colour and the reason due to which it has this colour.
(c) What happens when electricity is passed through brine? Write the chemical equation for it.
Answer.
(a) HCl is acid and NaOH is base whose combination forms the common salt. Its formula is NaCl (Sodium chloride). It is obtained from sea water.
(b) Rock salt is the common name for the mineral “halite”. Its chemical formula is NaCl.

It may be white or light blue or yellow depending upon impurities present in it.

(c) $2NaCl + 2H_2O \xrightarrow{\text{electrolysis}} 2NaOH + H_2 + Cl_2$

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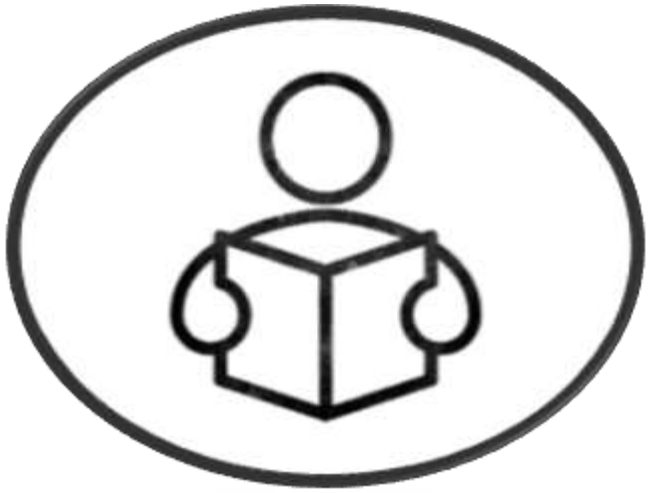

CHAPTER 3 -METALS AND NON-METALS

CH3-SECTION A - MCQ (1 MARKS)

1).**Which of the following oxides of iron would be obtained on the prolonged reaction of iron with steam?**

a) FeO

b) Fe_2O_3

c) Fe_3O_4

d) Fe_2O_3 and Fe_3O_4

Answer: Option (c)

2)**.** Which of the following metals is the least reactive?

a) Sodium

b) Zinc

c) Copper

d) Gold

Answer: d) Gold

3) **A non-metal used to preserve food material is:**

a) Carbon

b) Phosphorus

c) Sulphur

d) Nitrogen

Answer: Option (d)

4) **) The metals that float when treated with water are:**

a) Manganese and sodium

b) Sodium and calcium

c) Magnesium and sodium

d) Magnesium and calcium

Correct Answer: Option (d)

5) **Aluminium is used for making cooking utensils. Which of the following properties of aluminium are responsible for the same?**

(i) Good thermal conductivity

(ii) Good electrical conductivity

(iii) Ductility

(iv) High melting point

a) (i) and (ii)

b) (i) and (iii)

c) (ii) and (iii)

d) (i) and (iv)

Answer: Option (d)

6) **When hydrochloric acid is added to barium hydroxide, a white-coloured compound is formed. Which of the following option gives the complete chemical reaction?**

a) $HCl + Ba(OH)_2 \rightarrow BaCl_2 + 2HOH$

b) $2HCl + Ba(OH)_2 \rightarrow BaCl_2 + 2HOH$

c) $2HCl + Ba(OH)_2 \rightarrow BaH_2 + 2HCl + O_2$

d) $HCl + 2Ba(OH) \rightarrow 2BaCl_2 + 2HOH + O_2$

Answer: Option (b)

7) **When calcium oxide is added to water, it completely dissolves in water without forming bubbles. What products are formed in this reaction?**

(a) Ca and H_2

(b) Ca and H_2O_2

(c) $Ca(OH)_2$

(d) CaH_2

Question 8.If metal is found in a free state in nature, it is called its :

(a) native state

(b) crust state

(c) mineral state

(d) none of these.

Answer:(a) native state

Question 9.The element found in free state in nature is :

(a) copper

(b) gold

(c) silver

(d) all these.

Answer:(d) all these.

Question 10.Metals are extracted from:

(a) compounds

(b) minerals

(c) ores

(d) both minerals and ores.

Answer:

(c) ores

CH3-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS)

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

Q.1. Assertion (A) : Hydrogen gas is not evolved when a metal reacts with nitric acid.

Reason (R) : Nitric acid is a strong oxidising agent.

Q.2. Assertion (A) : Highly reactive metals are obtained by electrolytic reduction.

Reason (R) : In the electrolytic reduction, metal is deposited at the cathode.

Q.3. Assertion (A): Bronze is an alloy of copper and tin.

Reason (R) : Alloys are heterogeneous mixture of metals with other metals and non-metals.

Q.4. Assertion (A) : Zinc oxide is amphoteric in nature.
Reason (R): Zinc oxide reacts with both acids and bases.

Q.5. Assertion (A) : Magnesium chloride is an ionic compound.
Reason (R) : Metals and non-metals react by mutual transfer of electrons.

Q.6. Assertion (A): Zinc can easily displace copper on reacting with a solution of copper sulphate.
Reason (R): Copper is more reactive metal as compared to Zinc.

Q.7. Assertion (A) : Zinc carbonate is heated strongly in presence of air to form zinc oxide and carbon dioxide.
Reason (R) : Calcination is the process in which a carbonate ore is heated strongly in the absence of air to convert into metal oxide.

Q.8. Assertion (A): Zinc becomes dull in moist air.
Reason (R) : Zinc is coated by a thin film of its basic carbonate in moist air.

Q.9. Assertion (A) : MgCl, is a covalent compound.
Reason (R) : MgCl, is a good conductor of electricity in molten state.

Q.10. Assertion (A) : Anodising is a method to prevent metal from corrosion.
Reason (R) : Anodising is a process of coating iron with a layer of zinc.

CH3-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

1.What is meant by amphoteric oxides? Choose the amphoteric oxides from the following: Na2O, ZnO, CO2, Al2O3, H2O

Answer: Amphoteric oxides are those which show acidic as well as basic character, i.e., they react with bases as well as acids. ZnO and Al2O3 are amphoteric oxides.

2. Give reason for the following:

(i) Hydrogen gas is not evolved when most of the metals react with nitric acid.

(ii) Metals conduct electricity.

Ans: (i) Hydrogen gas is not evolved when most metals react with nitric acid. It is because HNO3 is strong oxidising agent. It oxidises the H2 produced to water and itself gets reduced to any of the nitrogen oxides (N2O, NO, NO2).

(ii) Metals conduct electricity due to the flow of free electrons present in them.

3. Why does calcium float on water?

Ans: When calcium is added to water it quickly reacts with it to release hydrogen gas. The bubbles of the hydrogen gas sticks to the surface of calcium and makes it float on water.

4. On adding dilute HCl acid to copper oxide powder, the solution formed is blue-green. Predict the new compound formed which imparts a blue-green colour to the solution.

Ans: The name of the compound is cupric chloride which gives blue-green colour to the solution.

$CuO + 2HCl \rightarrow CuCl_2 + H2O$

5. Give reasons for the following:

(a) Gold and silver are used to make jewellery.

(b) Carbonate and sulphide ores are usually converted into oxides prior to reduction during the process of extraction.

Ans: (a) It is because gold and silver are highly lustrous, malleable and ductile.

(b) The reduction of metal oxides into metals is easy, fast and cheap than converting carbonate and sulphide ore into metals.

CH3-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

1.What is meant by amphoteric oxides? Choose the amphoteric oxides from the following: Na2O, ZnO, CO2, Al2O3, H2O

Answer: Amphoteric oxides are those which show acidic as well as basic character, i.e., they react with bases as well as acids. ZnO and Al2O3 are amphoteric oxides.

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(b) The reduction of metal oxides into metals is easy, fast and cheap than converting carbonate and sulphide ore into metals.

CH3-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

1.Rusting of iron refers to the formation of layer of rust, a mixture of iron oxides, on the surface of iron objects or structures. This rust is formed from a redox reaction between oxygen and iron in the environment containing moist air. This process is characterized by the formation of a red flaky layer on iron article.

i) Rusting of iron takes place in:

(a) Ordinary water

(b) water

(c) Both a and b

(d) None

ii) Rusting involves?

(a) Reduction

(b)oxidation

Decomposition

(d) Displacement

3. of iron is

a) oxidative corrosion

b) Liquid metal corrosion

c) Wet corrosion

d) Corrosion by other gases

4. Galvanization refers to depositing layer of:

a) Zinc

b) Sodium

c) Potassium

d) Magnesium

5. Silver corrode and the composition of layer formed is:

a) Ag N

b) Ag2O

c) Ag_2S

d)Both c and a

1.What is meant by amphoteric oxides? Choose the amphoteric oxides from the following: Na_2O, ZnO, CO_2, Al_2O_3, H_2O

Answer: Amphoteric oxides are those which show acidic as well as basic character, i.e., they react with bases as well as acids. ZnO and Al_2O_3 are amphoteric oxides.

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5. Give reasons for the following:

(a) Gold and silver are used to make jewellery.

(b) Carbonate and sulphide ores are usually converted into oxides prior to reduction during the process of extraction.

Ans: (a) It is because gold and silver are highly lustrous, malleable and ductile.

(b) The reduction of metal oxides into metals is easy, fast and cheap than converting carbonate and sulphate ore into metals.

CH3-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Q1. (i) Write down the electronic configuration

of magnesium and oxygen.

(ii) Give two general properties of the compound formed by combination of magnesium and oxygen.

(iii) Show the formation of this compound by the transfer of electrons

Ans:

(i) Atomic number of magnesium (Mg) = 12

∴ Its electronic configuration = 2, 8, 2

Atomic number of oxygen = 8

Electronic configuration of oxygen = 2, 6

(ii) Magnesium (Mg) reacts with oxygen (O2) to form magnesium oxide (MgO).

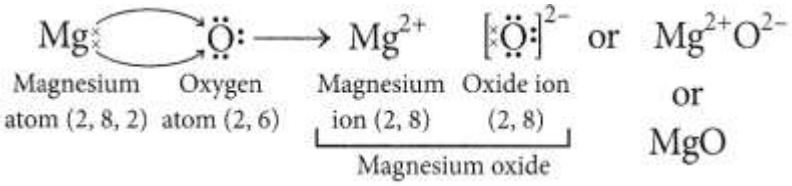
$2Mg + O_2 \rightarrow 2MgO$

Properties of MgO are :

(a) It involves ionic bonding.

(b) It has high melting point due to strong electrostatic forces of attraction between Mg^{2+} and O^{2-} ions.

(iii) In the formation of magnesium oxide, two electrons are transferred from magnesium atom to oxygen atom as represented.



Q2. 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

Ans:

(i) On heating, mercuric oxide decomposes to give mercury .and oxygen.

$$2HgO_{(s)} \xrightarrow{Heat} 2Hg_{(l)} + O_{2(g)}$$

(ii) On heating mixture of cuprous oxide and cuprous sulphide, copper and sulphur dioxide are produced.

$$2Cu_2O_{(s)} + Cu_2S_{(s)} \xrightarrow{Heat} 6Cu_{(s)} + SO_{2(g)} \quad 3MnO_{2(s)} + 4Al_{(s)} \xrightarrow{Heat} 3Mn_{(l)} + 2Al_2O_{3(s)}$$

(iii) When aluminium is heated with manganese dioxide, manganese and aluminium oxide are formed.

$$3MnO_{2(s)} + 4Al_{(s)} \xrightarrow{Heat} 3Mn_{(l)} + 2Al_2O_{3(s)}$$

(iv) Ferric oxide reacts with aluminium to produce aluminium oxide and iron.

$$Fe_2O_{3(s)} + 2Al_{(s)} \xrightarrow{Heat} 2Fe_{(l)} + Al_2O_{3(s)}$$

(v) On calcination, zinc carbonate produces zinc oxide and carbon dioxide.

$$ZnCO_{3(s)} \xrightarrow{\text{Calcination}} ZnO_{(s)} + CO_{2(g)}$$

Q3. (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.

Ans:

(a) Extraction of metals of medium reactivity:

The metals in the middle of the reactivity series are zinc, iron, lead, etc. The carbonate ores first need to get converted to oxides as it is easier to get metal from their oxides.

The ore on treatment with dilute hydrochloric acid produces brisk effervescence hence, it must be a carbonate ore. Calamine (ZnCO3) is an important carbonate ore of zinc.

Steps required to obtain metal from the enriched carbonate Are:

(i) Conversion of the carbonate ore into metal oxide : This is done by calcination (for carbonate ores).

Calcination is the process of heating the ore strongly in the absence or limited supply of air. The zinc carbonate on heating decomposes to form zinc oxide as shown :

$$\underset{\substack{\text{Zinc carbonate}\\ \text{(Calamine-ore of Zn)}}}{ZnCO_{3(s)}} \xrightarrow[\text{(Absence of air)}]{\text{Heat}} ZnO_{(s)} + CO_{2(g)}$$

(ii) Reduction of the metal oxide to metal : As zinc is moderately reactive, zinc oxide cannot be

reduced by heating alone. Hence, it is reduced to zinc by using a reducing agent such as carbon

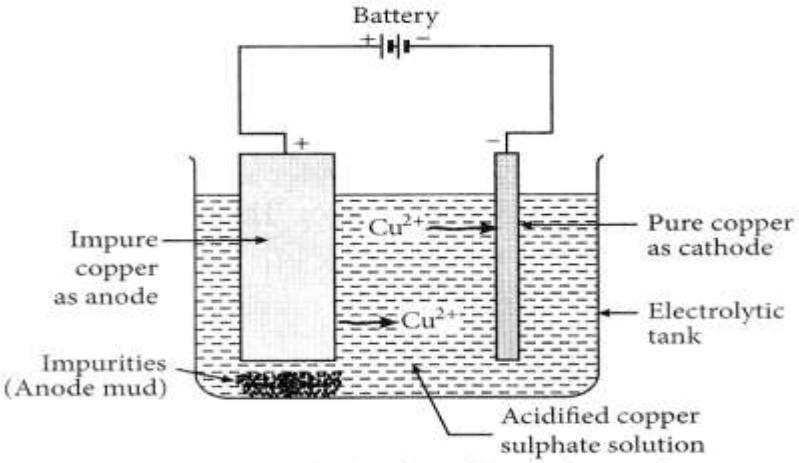
$$\underset{\text{Zinc oxide}}{ZnO_{(s)}} + \underset{\text{Coke}}{C_{(s)}} \xrightarrow{\text{Heat}} \underset{\text{Zinc}}{Zn_{(s)}} + \underset{\text{Carbon monoxide}}{CO_{(g)}}$$

.

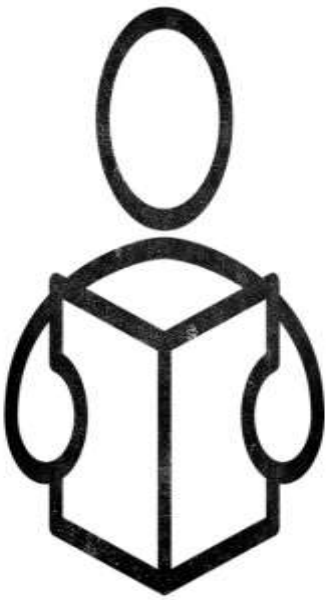
(b) Copper glance (Cu2S) when heated in air gets partially oxidised to copper oxide which further reacts with the remaining copper glance to give copper metal.

$$\underset{\text{Copper glance}}{2Cu_2S_{(s)}} + \underset{\text{(from air)}}{3O_{2(g)}} \xrightarrow{\Delta} \underset{\text{Copper oxide}}{2Cu_2O_{(s)}} + \underset{\text{Sulphur dioxide}}{2SO_{2(g)}}$$

$$2Cu_2O_{(s)} + Cu_2S_{(s)} \xrightarrow{\Delta} \underset{\text{Copper metal}}{6Cu_{(s)}} + SO_{2(g)}$$



Experimental set-up for the electrolytic refining of copper



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CHAPTER 4 - CARBON AND ITS COMPOUNDS

CH4-SECTION A - MCQ (1 MARKS)

1. Which of the following statements are correct for carbon compounds?

(i) Most carbon compounds are good conductors of electricity.

(ii) Most carbon compounds are poor conductors of electricity.

(iii) Force of attraction between molecules of carbon compounds is not very strong.

(iv) Force of attraction between molecules of carbon compounds is very strong.

(a) (ii) and (iv)

(b) (ii) and (iii)

(c) (i) and (iv)

(d) (i) and (iii)

Answer: b

---

2. C3H8 belongs to the homologous series of

(a) Alkynes

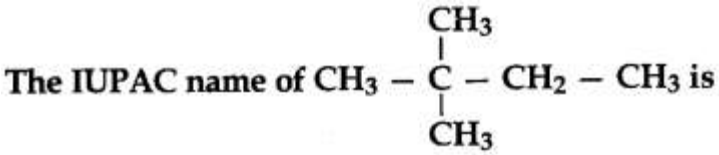
(b) Alkenes

(c) Alkanes

(d) Cyclo alkanes

Answer: c

3.

The IUPAC name of  is

(a) 2-ethyl-2-methyl propane

(b) 2, 2-dimethylbutane

(c) 1,1,1-trimethyl propane

(d) 2, 2-methyl butane

Answer: b

---

4. Which of the following is the formula of Butanoic acid?

(a) $CH_3CH_2CH_2CH_2COOH$

(b) $COOH-CH_2-CH_2-CH_2-CH_3$

(c) $CH_3 - \underset{\displaystyle COOH}{\underset{|}{CH}} - CH_2 - CH_3$

(d) $CH_2 - CH_2 - CH_2 - COOH$

Answer: d

---

5. The number of isomers of pentane is

(a) 2

(b) 3

(c) 4

(d) 5

Answer: b

---

6. Which of the following will undergo addition reactions?

(a) CH4

(b) C3H8

(C) C2H6

(d) C2H4

Answer: d

---

7. When ethanoic acid is treated with NaHCO^ the gas evolved is

(a) H2

(b) CO2

(c) CH_4

(d) CO

Answer: b

---

8. Ethanol on complete oxidation gives

(a) acetic acid/ethanoic acid

(b) CO_2 and water

(c) ethanal

(d) acetone/ethanone

Answer: b

---

9. Which of the following will give a pleasant smell of ester when heated with ethanol and a small quantity of sulphuric acid?

(a) CH_3COOH

(b) CH_3CH_2OH

(c) CH_3OH

(d) CH_3CHO

Answer: a

---

10. Name the functional group present in CH_3COCH_3.

(a) Alcohol

(b) Carboxylic acid

(c) Ketone

(d) Aldehyde

Answer: c

CH4-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS)

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

1. Assertion(A): Diamond is the hardest natural known substance.

Reason (R) : Diamond is used for cutting marble, granite and glass.

Ans: B

2.Assertion(A): Carbon possesses property of catenation.

Reason (R) : Carbon atoms form double as well as triple bonds during catenation.

Ans: B

3. Assertion(A): Covalent compounds are generally poor conductor of electricity.

Reason (R) : They consist of molecules and not ions which can transfer charge.

Ans: A

4. Assertion(A): Diamond is not good conductor of electricity.

Reason: It has no free electrons.

Ans: A

5. Assertion(A): Carbon and its compounds can be used as fuels.

Reason (R) : They are highly inflammable and have high calorific value.

Ans: A

6. Assertion(A): Graphite is a good conductor of electricity.

Reason (R) : It has one free valence electron.

Ans: A

7. Assertion(A): In alkanes, alkenes and alkynes the valency of carbon is always four.

Reason (R) : All hydrocarbons except alkanes contain double bonds.

Ans: C

8. Assertion(A): Graphite is soft and slippery to touch.

Reason (R) : Graphite has sheet like layered structure.

Ans: A

9. Assertion(A): Diamond and graphite do not have the same crystal structure.

Reason (R) : Diamond is crystalline while graphite is amorphous.

Ans: C

10. Assertion(A): Saturated hydrocarbons are chemically less reactive.

Reason (R) : All the valencies of carbon atom are satisfied by single covalent bonds.

Ans: A

CH4-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

1.Give reasons for the following:

(i)The element carbon forms a very large number of compounds.

(ii)Air holes of a gas burner have to be adjusted when the heated utensils get blackened by the flame.

Ans.(i)This is due to the property of catenation and tetravalency of carbon.

(ii)For the complete combustion of gas coming out of the gas burner.

2.What is a homologous series of compounds?

Ans.It is a series of compound having similar structural formulae,same functional group and hence similar chemical properties.Any two adjacent members of a homologus series differ by CH2 unit in their molecular formulae.

3.Explain isomerism.State any two characteristics of isomers.

Ans.Two or more compounds having same molecular formula but different properties are called isomers and this phenomenon is called isomerism.They have same molecular formula and molecular mass.But they have different properties and structural formula.

4.(i)Why are most carbon compounds poor conductors of electricity?

(ii)Write the name of saturated compound in which the carbon atoms are arranged in a ring.Give the number of single bonds present in this compound.

Ans.(i)Carbon compounds do not dissociate to give ions and remains as molecules due to covalent bonds.That's why they are poor conductor.

(ii)The name of compound is cyclohexane,C6H12.Total number of single bond is 18.

5.Explain why carbon forms covalent bond.

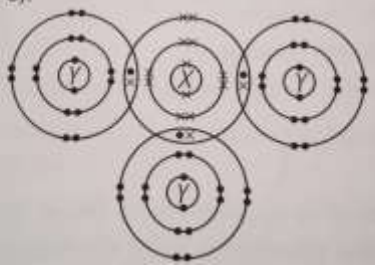
Ans.(i)Carbon has electronic configuration 2,4.It can gain four electrons to form anion or lose 4 electron to form cation.Both are not possible dut to energy considerations.Carbon overcome this problem by sharing electrons and forming covalent bond.

CH4-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

1. An element X has proton number of 15, while element Y has a proton number of 17. Draw a dot and cross diagram to show all electrons in a molecule formed from elements X and Y.

Sloution:

1. Electronic configuration of *X* : 2, 8, 5
Atom *X* contributes three electrons for sharing.
Electronic configuration of *Y* : 2, 8, 7
Each atom of *Y* contributes one electron for sharing.
Therefore, three atoms of *Y* contribute three electrons for sharing.
One atom of *X* will share three pairs of electrons with three atoms of *Y* to achieve the noble gas configuration.
Both atoms *X* and *Y* achieve the electronic configuration of argon (2, 8, 8).



2. What is the reason behind the fact that carbon have so many chemical comounds?

Solution: (I) Tetravalancy: Carbon have four electrons in its outermost shell due to which it is able to form bond with four different elements at one time. Carbon generally share these four electrons that's why it have strong bond.

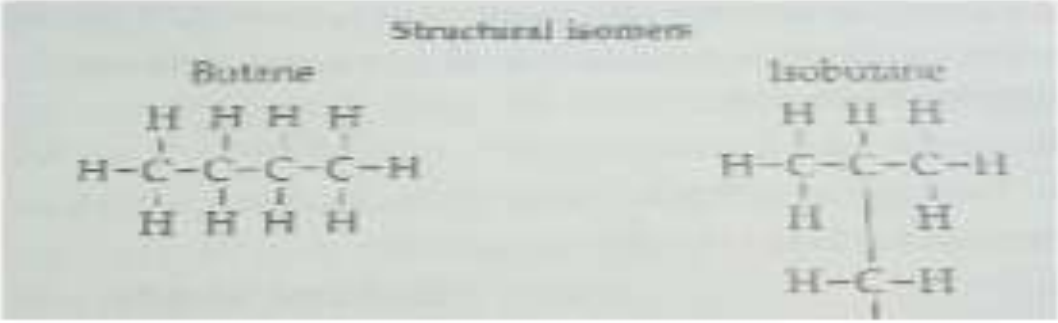
(ii) Catenation: Carbon have a special property to form bond to itself i.e. other carbon element.

CH4-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

Case based question

1.Read the following and answer any four questions.

The physical and chemical properties of hydrocarbons are directly related to their molecular geometries. Molecules that have the same molecular formula but different molecular geometries are called isomers. There are two major classes of isomers: structural isomers and stereoisomers.



In structural isomers, the atoms in each isomer are connected, or bonded, in different ways. As a result, structural isomers often contain different functional groups or patterns of bonding. Consider butane and Isobutane shown above, both molecules have four carbon and 10 hydrogen, but butane is linear and isobutane is branched. As a result, the two molecules have different chemical properties (such as lower melting point and boiling point for isobutane). Because of these differences, butane is typically used as fuel for cigarette lighters and torches, whereas isobutane is often employed as a propellant in spray cans.

(I) Why does carbon form large number of compounds?

(a) As it can self link with itself.

(b) As it has tetravalency.

(c) Due to property of catenation.

(d) All of the above.

(II) The self linking property of the element to form chain, branch or ring is called

(a) isomerism. (b) Catenation

(c) Tetravalency. (d) Allotrophy

(III) Which of the following is the correct isomer of C3H6O?

(a) C2H5CHO. (b) CH3COCH3

(c) CH3CHOCH3. (d) C2H5COCH3

(iv) How many isomeric alkanes can be formed the molecular formula C5H12?

(a) 1. (b) 2. (c) 3. (4)

(v) How many covalent bonds are present in C5H12?

(a) 14. (b) 15. (c) 16. (d) 14

Ans. (I) -(d) (II) -(b) (III) -(a) (iv)-(c) (v) -(c)

2.Carbon has atomic number 6.It has 6 electrons.Its electronic configuation is 2,4.It can complete its octet by losing,gaining or sharing of electrons.To lose or to gain 4 electrons is not enetgitically feasible.Therefore in order to complete its octet ,carbon shares four electrons of its valence shell with other atoms.The bond formed by mutual sharing of electrons is called covalent bond.A covalent bond is called (__),double(=) or Triple bond by mutual sharing of one,two or three pairs.

1.Which of the following contains a triple bond?

(a)H2. (b)O2. (c)N2. (d)F2

Ans.(c)

2.Which of the following contains a double bond?

(a)Methane. (b)Water (c)Carbon dioxide. (d)Nitrogen molecule

Ans.(C)

3.H2 molecule contains

(a)Single bond. (b)double bond. (c)triple bond. (d)no bond

Ans.(b)

4.In CH4, carbon has ---------- electrons in its valence shell.

(a)4. (b)6. (c)8. (d)10

Ans.(a)

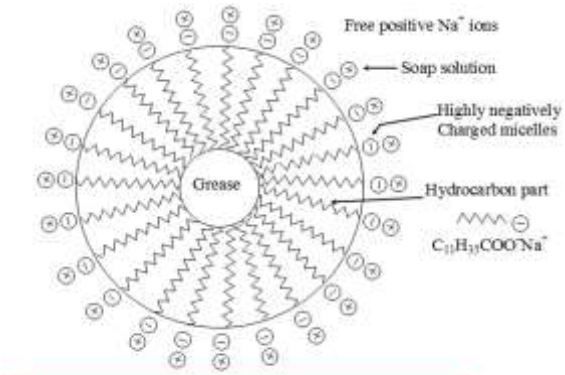
CH4-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

1. Expalain the cleaning action of soap with the help of diagram.

Solution: When soap is dissolved in water, its hydrophobic ends attach themselves to dirt and remove it from the cloth. First, the molecules of soap arrange themselves in micelle formation and trap the dirt at the centre of the cluster. These micelles remain suspended in water like particles in a colloidal solution.

The various micelles present in water do not come together to form a precipitate as each micelle repels the other because of the ion-ion repulsion. Thus, the dust particles remain trapped in micelles (which remain suspended) and are easily rinsed away with water.

Hence, soap micelles remove dirt by dissolving it in water.



Cleansing action of soap. Soap micelle entraps the oily dirt particle

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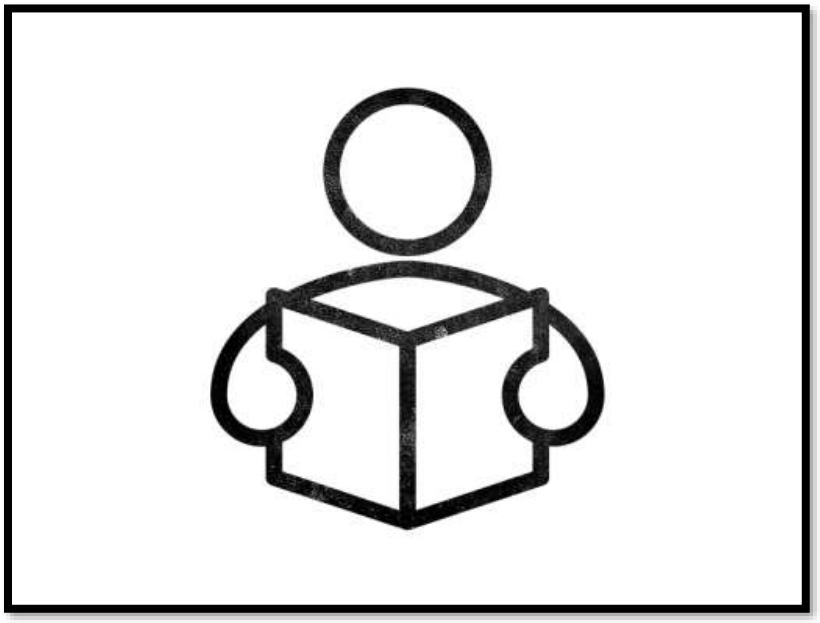

CHAPTER 5 - LIFE PROCESSES

CH5-SECTION A - MCQ (1 MARKS)

1. Which of the following are energy foods?
(a) Carbohydrates and fats
(b) Proteins and mineral salts
(c) Vitamins and minerals
(d) Water and roughage

Answer: a

---

2. In which mode of nutrition an organism derives its food from the body of another living organism without killing it?
(a) Saprotrophic nutrition
(b) Parasitic nutrition
(c) Holozoic nutrition
(d) Autotrophic nutrition

Answer: b

---

3. The mode of nutrition found in fungi is:
(a) Parasitic nutrition
(b) Holozoic nutrition
(c) Autotrophic nutrition
(d) Saprotrophic nutrition

Answer: d

---

4. Roots of the plants absorb water from the soil through the process of:
(a) diffusion
(b) transpiration

(c) osmosis
(d) None of these

Answer: c

---

5. The site of photosynthesis in the cells of a leaf is
(a) chloroplast
(b) mitochondria
(c) cytoplasm
(d) protoplasm

Answer: a

---

6. In amoeba, food is digested in the:
(a) food vacuole
(b) mitochondria
(c) pseudopodia
(d) chloroplast

Answer: a

---

7. Which of the following events in the mouth cavity will be affected if salivary amylase is lacking in the saliva?
(a) Starch breaking down into sugars.
(b) Proteins breaking down into amino acids.
(c) Absorption of vitamins.
(d) Fats breaking down into fatty acids and glycerol.

Answer: a

---

8. Which region of the alimentary canal absorbs the digested food?

(a) Stomach

(b) Small intestine

(c) Large intestine

(d) Liver

Answer: b

---

9. The contraction and expansion movement of the walls of the food pipe is called:

(a) translocation

(b) transpiration

(c) peristaltic movement

(d) digestion

Answer: c

---

10. When a few drops of iodine solution are added to rice water, the solution turns blue- black in colour. This indicates that rice water contains:

(a) fats

(b) complex proteins

(c) starch

(d) simple proteins

Answer: c

CH5-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS)

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

1. **Assertion(A):** Digestion breaks large complex molecules to simple smaller molecules which can be easily absorbed..

   Reason (R) : Digestion is necessary for the absorption of all molecules .

   Ans: C
2. **Assertion(A):** Lipases helps in the Emulsification of fats.

   Reason (R) :Lipases hydrolyses fats and oils.

   Ans: D
3. **Assertion(A): Alveoli contains an extensive network of blood vessels** .

   Reason (R) : Alveoli is the site where exchange of gases occur.

   Ans: A
4. **Assertion(A): There is no mixing of oxygenated and deoxygenated blood in the human heart** .

   Reason (R) : Valves are present in the heart which allows the movement of blood in one direction only.

   Ans: B
5. **Assertion(A):** Valves are present in the arteries.

   Reason (R) : Arteries carry oxygenated blood from heart to different body parts except pulmonary artery.

   Ans: D
6. **Assertion(A): Plants have low energy needs** .

   Reason (R) : Plants bodies have large proportion of dead cells .

   Ans: A
7. **Assertion(A): In humans , major amount of water is absorbed by the tubular part of nephron** .

Reason (R) : absorption of water depends on the dissolved waste to be excreted from the body.

Ans: B

8. **Assertion(A): Humans produces highly toxic substances, which if not eliminated can may cause death** .

Reason (R) : Excretory substances removes nitrogenous wastes from the body .

Ans: B

9. **Assertion(A):Energy is used during the process of respiration** .

Reason (R) : Respiration stores energy in the form of ATP..

Ans: D

10. **Assertion(A):** Photosynthesis is an Anabolic process.

Reason (R) :The process of photosynthesis occurs in Chlorophyll.

Ans: C

CH5-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

1.Name the following

(a)The process in plants that links light energy with chemical energy.

(b)An enzyme secreted from gastric glands in stomach that acts on proteins.

(c)The cell organelle where photosynthesis occurs.

(d)Cells that surround a stomatal pore

Ans.(a)Photosynthesis. (b)Pepsin (c)Chloroplast. (d) Guard cell

2.Why does absorption of digested food occurs mainly in the small intestine?

Ans.Absorption of digested food occurs mainly in the small intestine because:

(i)Digestion is completed in small intestine.

(ii)Finger like projection (villi) of small intestine provide large surface area for maximum absorption.

(iii)Villi of small intestine are richly supplied with blood vessels for carrying the absorbed food to diiferent parts of the body.(any two)

3.What is the purpose of making urine in the human body? Name the organs that stores and release urine.

Ans.To remove nitrogenous waste from body urine is produced.It mainly consist of urea which is removed from the blood by filteration into Bowman's capsule.The filterate carrying urea passes from nephrons into a space inside kidney leading to the ureter.From ureter urine goes in urinary bladder and stored there until released by urethra.

4. Why do arteries have thick and elastic walls whereas veins have valves?

Ans.Arteries carry oxygenated blood from heart to various body parts.The flow of blood is fast and jerky under pressure.Therefore arteries have thick ,elastic walls.Veins collect blood from various body part and bring to the heart.They have valve .So blood flow is smooth under no pressure.The thin walls of veins therefore allow smooth flow of blood towards heart.

5.Explain the process by which inhalation occurs during breathing in human beings.

Ans.The process of inhalation begins when diaphragm and muscles attached to the ribs contract.Which flattens diaphragm.This expand thoracic cavity so its volume increases.

CH5-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

3. What are the difference between autotrophic and heterotrophic nutrition?

Solution:

Autotrophic Nutrition	Heterotrophic Nutrition
The organisms are capable of preparing their own food using simple substances that are available in their surroundings.	The organisms completely depend on others for their nutrition. They depend on surrounding plants and animals for food.
The conditions necessary for autotrophic nutrition are carbon dioxide, water, chlorophyll and water.	They cannot make the food from available inorganic substances like carbon dioxide, water and sunlight.
Phototrophic and Chemotrophic are the two types of autotrophic nutrition	Holozoic, parasitic, symbiotic association, and saprophytic are the four types of heterotrophic nutrition
Plants are an example of autotrophic nutrition	Animals and some plants are an example of heterotrophic nutrition
Autotrophs are the producers in the food chain	Heterotrophs are the consumers in the food chain

4. Why is diffusion insufficient to meet the oxygen requirements of multicellular organism like human?

Solution: Unlike unicellular organisms, in higher multicellular forms including man, every cell of the body is not in direct contact with the external environment. Only the surface layer cells of skin are exposed to the surrounding environment. The rest of the body cells of internal organs are not in direct contact with environment. So, exchange of gases by diffusion is not possible in these cells. Thus, multicellular suring organisms require certain specialised organs for breathing, allows exchange of gases and transport of gases to meet oxygen requirement.

5. Draw a schematic representation of transport and exhange of gases during transportation of blood in human being and label it.

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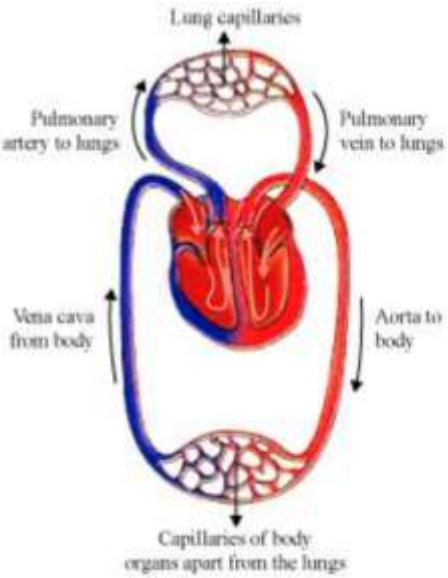


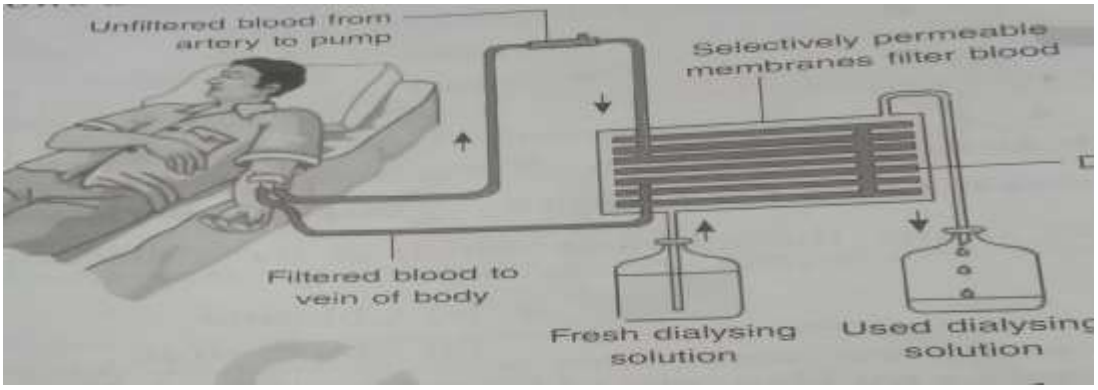
CH5-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

1) A doctor has advised Sameer to reduce sugar intake in his diet and do regular exercise after checking his blood test reports. Which disease do you think Sameer is suffering from? Name the hormone responsible for this disease and the organ producing the hormone.What is the role of this hormone in our body and What is one more speciality of this organ?
Ans.Sameer is suffering from diabetes.Deficiency of insulin is responsible for this.Insulin is released by pancrease which convert excess of glucose in glycogen.Pancrease work as exocrine gland also and release several hormone like amylase,Lipase and Tripsinogen which helps in digestion of components of food.

2. Read the following and answer any four questions.

The kidney act as organs of exctetion in human body.Normal activities of kidney get reduced by several factors such as infections,injury or restricted blood flow.This can lead to kidney failure and

even death.Nowadays ,kidney failure can be taken care of by the artificial kidney.The artificial kidney is a machine that removes nitrogenous waste products from the blood.This device consist of long tubes with a semipermeable lining suspended in a dialysing solution.This solution has the same osmotic pressure as that of blood .When patient 's blood moves inside these tubes ,the waste from patient's blood comes out into the dialysing solution and the purified blood is transferred back into the body.The diagram given below shows the functioning of artificial kidney.



(i)Which of the following statements correctly describes the function of artificial kidney shown in the above diagram?

(a)It is a device to remove nitrogenous waste products from blood through dialysis.

(b)It is a device used to add urea into the blood through dialysis.

(c)It is a device used to mrasure blood predsure.

(d)It is a device used to measure blood sugar level.

(ii) Which of the following substance is not present in the dialysing solution?

(a) Water (b) Ammonia (c)urea (d)carbon dioxide

(iii) If a person is on dialysis, he is most likely to be suffering from severe ailment of the (a)muscular system (b)digestive system

(c)circulatory system (d) excretory system

(iv)The process of cleaning of blood of a person using artificial kidney is called

(a)hydration (b)photolysis (c)dialysis (d)transportation

(v) The functional unit of kidney in human is

(a)neuron (b) nephron (c)Alevolus (d)Villus

Ans.(i)--(a), (ii)--(c) (iii)--(d), (iv)--(a) (v)---(c)

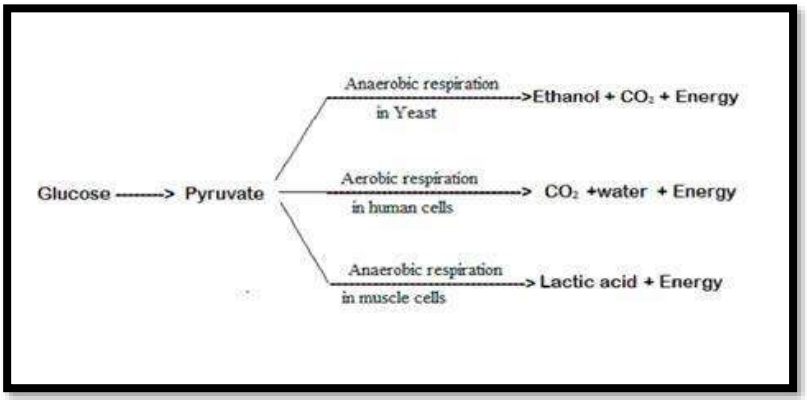
CH5-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

2. What are two different ways in which glucose is oxidise to provide energy in various organism?

Write two different ways of oxidation of glucose in animals.

Solution: Aerobic respiration The oxidative breakdown of respiratory substrates with the help of atmospheric O is known as aerobic respiration. During this process, the respiratory substrate (glucose) is completely broken down into carbon dioxide and water by the process of oxidation and large amount of energy (38 ATP) is produced. Aerobic respiration Includes glycolysis, which a common to both aerobic and Anaerobic respiration. The pyruvic acid (pyruvate) molecules formed during glycolysis are carried to the mitochondria where they completely break down into CO and H_2O with The evolution of a large amount of energy

Anaerobic respiration: Oxidation of respiratory substrates in absence of oxygen is termed as anaerobic respiration it Involves incomplete breakdown of respiratory substrates in which the end products, such as ethanol or lactic acid are formed and small amount of energy is released. It involves glycolysis, during which glucose is degraded into pyruvate Further breakdown of pyruvic acid in absence of oxygen result in the production of ethanol or lactic acid. Anaerobic oxidation of glucose in microorganisms forms ethanol and CO, and in muscle cells of humans, glucose is anaerobically metabolised into lactic acid



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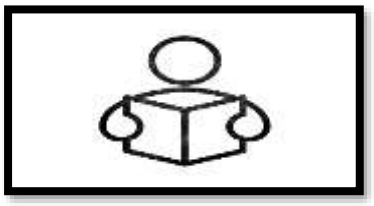

CHAPTER 6 - CONTROL AND COORDINATION

CH6-SECTION A - MCQ (1 MARKS)

1. **Why do plants respond to environmental stimuli more slowly than animals?**

A) Plants have more complex hormones than animals.

B) Plants lack a nervous system.

C) Plants do not need to respond to stimuli.

D) Plants have a more robust cell wall structure.

2. **Which of the following hormonal interactions is essential for breaking the dormancy of seeds and promoting germination?**

A) High levels of abscisic acid and low levels of cytokinins.

B) High levels of auxins and low levels of gibberellins.

C) High levels of gibberellins and cytokinins, with low levels of abscisic acid.

D) Equal levels of auxins and abscisic acid.

3. **Which of the following is a primary cause of movement in plant parts in response to external stimuli?**

A. Photosynthesis B. Respiration

C. Unequal growth due to plant hormones D. Water absorption

4. **Which of the following best describes tropism in plants?**

A. Movement of a plant part in response to the stimulus, while remaining attached to the main body.

B. Detachment of plant parts from the main body in response to stimuli.

C. Random movement of plant parts without any specific cause.

D. Movement of plants to a new location in search of light

5. Dandelion flowers open the petals in bright light during the daytime but close the petals in dark at night. This response of dandelion flowers to light is called :

(a) phototropism (b) thigmonasty (c) chemotropism (d) photonasty

6. Which of the following cannot be considered a receptor ?

(a) ear (b) nose (c) muscle (d) eye

7. Which of the following is not an involuntary action ?

(a) vomiting (b) chewing (c) heart beat (d) salivation

8. One of the following controls the peristaltic movements of alimentary canal. This one is :

(a) cerebrum (b) cerebellum (c) pons (d) medulla

9. Dwarfism results due to :

(a) excessive secretion of thyroxine hormone

(b) excessive secretion of growth hormone

(c) less secretion of adrenaline hormone

(d) less secretion of growth hormone

10. The underactive endocrine gland which causes goitre is :

(a) pancreas (b) thyroid (c) adrenal (d) pituitary

Answers

1. B) Plants lack a nervous system.
2. C) High levels of gibberellins and cytokinins, with low levels of abscisic acid.
3. C. Unequal growth due to plant hormones
4. A. Movement of a plant part in response to the stimulus, while remaining attached to the main body.
5. D. photonasty
6. (c) muscle
7. (b) chewing
8. (d) medulla
9. (d) less secretion of growth hormone
10. (b) thyroid

CH6-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

Q.1. Assertion(A) : Insulin regulates blood sugar level.

Reason (R) : Insufficient secretion of insulin will cause diabetes.

Answer(a)

Q.2. Assertion(A) : Animals can react to stimuli in different ways.
Reason (R) : All animals have a nervous system and an endocrine system involving hormones.
Answer(a)

Q.3. Assertion(A): The effect of auxin hormone on the growth of root is exactly opposite to that on a stem.
Reason (R) : Auxin hormone increases the rate of growth in root and decreases the rate of growth in stem.
Answer(c)

Q.4. Assertion(A): A receptor is a specialized group of cells in a sense organ that perceive a particular type of stimulus.
Reason (R) : Different sense organs have different receptors for detecting stimuli.
Answer(b)

Q.5. Assertion(A): Cyton region of nerve fibre collects information for the brain.
Reason (R): Nerve fibres can either have or lack myelin sheath.
Answer(d)

Q6. Assertion : Plants lack the nervous system, but they do coordinate.
Reason : It is so because of hormones.
Ans : (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

Q7. Assertion : Reflex actions are automatic and repid responses to stimuli.
Reason : These actions are controlled by brain.
Ans : (c) Assertion (A) is true but reason (R) is false

Q8. Assertion : Olfactory receptors detect taste.
Reason : Olfactory receptors are present in cerebellum.
Ans : (e) Both Assertion and Reason are false.

Q9. Assertion : Cytokinins are present in highest concentration in fruits and seeds.
Reason : Cytokinins are responsible for promoting cell division.
Ans : (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

Q10. Assertion : Males have more stature than females during puberty.
Reason : This is because of presence of thyroxin in the blood of femalses.
Ans : (c) Assertion (A) is true but reason (R) is false

CH6-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

1. How are reflex actions important? Comment.
   Ans- reflex actions protect us in emergency situation where immediate physical or physiological response is needed.
2. How do plants respond to their environment ? Does it help them in survival?
   Ans- plants respond to their environment with the help of phytohormones.

CH6-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

1. What is the difference between a reflex action and walking?

Solution: Reflex actions are the involuntary actions that occur in response to stimuli. They occur without involvement of conscious areas of brain. All the reflex actions are unconscious actions. Reflex action involves the brain and spinal cord of central nervous systems.

On the other hand, voluntary actions are those which occur under the control of cerebellum of the brain. Walking is learnt as we grow. Walking is controlled by the brain and is consciously used whenever required.

2. What happens at the synapse between two neurons?

Solution: At the synapse between two neurons, electric signals are converted into chemicals that can easily cross over the gap and pass on the chemical messenger to the next neuron where it is converted back to electrical signal.

3. Which part of the brain maintains the posture and equilibrium of the body?

Solution: Cerebellum, which is a part of the brain, is responsible for controlling the motor functioning. Hence, it is the part engaged in the maintenance of posture and equilibrium of the body.

4. How do we detect the smell of an agarbatti (incense stick)?

Solution: The smell of an agarbatti is detected by the nose. The olfactory receptors present in the nose sends electrical signal to the fore brain. The fore brain interprets this signal as the smell of the incense stick.

5. What is the role of the brain in reflex action?

Solution: Reflex actions are formed instantaneously in response to a stimulus that has no time to think. For instance, the sensory nerves that detect heat are connected to the nerves that move the muscles of the hand. Such a connection of detecting the signal from the nerves (input) and responding to it quickly (output) is known as reflex arc.

Reflex action are generated in spinal cord and the information also reaches brain. This helps the brain to record this event and remember it for future use. Brain helps the person to get awareness of the stimulus and prevent the danger posed by the situation in the future.

CH6-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

CASE STUDY

1. If the body design in the squirrel relied only on electrical impulses via nerve cells, the range of tissues instructed to prepare for the coming activity would be limited. On the other hand, if a chemical signal were to be sent as well, it would reach all cells of the body and provide the wideranging changes needed. This is done in many animals, including human beings, using a hormone called adrenaline that is secreted from the adrenal glands.

i) which is the target organ for the adrenaline hormone?

Ans: Heart is the target organ for the adrenaline hormone which increases the heartbeat rate.

ii) Which hormone is released by thyroid gland?

Ans: Thyroxine is released by thyroid gland.

iii) What is the function of thyroxine hormone?

Ans: It regulates carbohydrate, protein and fat metabolism in the body and promote the best balance for growth.

iv) Name the hormone released by ovary?

Ans: Estrogen and progesterone

V) Name the three hormonal glands located in the brain?

Ans: Pineal, pituitary and hypothalamus

2.Some plants like the pea plant climb up other plants or fences by means of tendrils. These tendrils are sensitive to touch. When they come in contact with any support, the part of the tendril in contact with the object does not grow as rapidly as the part of the tendril away from the object. This causes the tendril to circle around the object and thus cling to it. More commonly, plants respond to stimuli slowly by growing in a particular direction. Because this growth is directional, it appears as if the plant is moving.

i) How many type of tropism are shown by plants? Name them.

Ans: Generally there are 6 type of tropism namely phototropism, gravitropism, chemotropism, thigmotropism, thermotropism and hydrotropism.

ii) The touch me not plant is an example of which tropism?

Ans: it is an example of thigmotropism.

iii) give one example of chemotropism?

Ans: growth of pollen tubes to wheels is one example of chemotropism.

iv) Name the plants hormone which promotes cell division?

Ans: Cytokinins promotes cell division in plants.

v) Name the plant hormone which inhibits growth?

Ans: Abscisic acid

CH6-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Q 1. What are plant hormones? How is the movement of leaves of a sensitive plant different from the movement of a shoot towards light? Write 5 points

Solution: Plant hormones are the organic substances produced at certain sites of a plant and are translocated to other parts based on the requirement. Plant hormones help to coordinate growth, development and responses to the environment.

Ex: Auxin's Gibberlin's, cytokines, abscisic acid and ethylene.Movement of leaves of a sensitive plant

Movement of a shoot towards light

1 It does not depend on the direction of stimulus applied. Depends on the direction of stimulus applied.

2 Nastic movement Tropic movement

3 Touch is the stimulus Light is the stimulus

4 Caused by the sudden loss of water from the swellings at the base of leaves Caused by the unequal growth on the two sides of the shoot.

5 Not a growth movement Growth movement

6 Occurs very fast Occurs slowly

Q.2. Design an experiment to demonstrate hydrotropism.

Solution: To demonstrate hydrotropism in plants.

Procedure :

i. Plant a seedling in a vessel containing soil.

ii. Adjacent to the seedling put a porous pot containing water.

iii. Leave the set up for few days.

Observation : iv. On examining the roots, it is observed that the roots bend towards the source of water and do not grow straight.

Result : It confirms that plants show hydrotropism as the roots bend towards the porous pot of water. As hydrotropism is a plant-growth response in which the direction of growth is determined by a stimulus of gradient in water concentration.

Q3. How does chemical coordination take place in animals?How does our body respond when adrenaline is secreted into the blood?

Solution:Chemical coordination takes place in animals with the help of chemical messengers called hormones. Hormones are the chemicals that are secreted by specific endocrine glands. Hormones regulate the growth, development and homeostasis of the animals.

Adrenaline is a hormone secreted when a person is frightened or mentally disturbed. When Adrenaline reaches the heart, heartbeat will increase to increase blood supply to our muscles. Adrenaline also increases the breathing rate because of contraction of diaphragm and the rib

muscles. Adrenaline rush also increases blood pressure and allows entry of more glucose into blood. All these occur when our body responds to the secretion of adrenaline into our blood.

4. Why are some patients of diabetes treated by giving injections of insulin?

Solution:

Diabetes is a condition where the pancreatic cells of a person stops producing or reduces the production of insulin hormone. Insulin regulates blood glucose by converting extra glucose to glycogen. When insulin is not produced adequately, a person's blood glucose level is affected and this leads to adverse effects. In order to maintain the insulin and blood glucose levels, diabetes patients are treated with injections of insulin.

Q5. What is the function of receptors in our body? Think of situations where receptors do not work properly. What problems are likely to arise?

Solution: Receptors are present throughout our body – mainly in sense organs. Receptors collect the information about changes that happen around us and send the signal/information to the brain which responds to the change detected. When receptors do not work properly, the environmental stimuli are not able to create nerve impulses and body does not respond9. What is the need for a system of control and coordination in an organism? There are various organs in an organism. These organs must be carefully controlled and coordinated for the survival of an organism. In the body of an organism, various fluids are secreted from the glands of the endocrine system. These hormones are responsible for the overall growth and development of an organism. All other daily decisions that include voluntary and involuntary actions are controlled by the central nervous system (CNS).

Coordination is needed for all human activities we perform. Our nervous system receives information from surroundings which is processed and a response is elicited. The endocrine system (hormonal system) helps in integrating various metabolic activities like reproduction, development, and all reflex actions (cope up with various give up situations).The hormonal system in plants helps in process of photosynthesis; they need carbon dioxide, water and sunlight. The stomatal opening in leaves opens

up to allow in carbon dioxide gas, the roots bend towards water, the stem grows towards sunlight, and the tendrils in climbing plants are supported by the hormonal system of the plant body.Thus, we need a control and coordination system in an organism.

Q6. How are involuntary actions and reflex actions different from each other?

ANS-

Involuntary actions	**Reflex actions**
1. Those actions which occur immediately without any thinking are called involuntary actions.	1. Reflex action is an immediate response to an event which does not require any processing by brain.
2. Involuntary actions are controlled by mid and hind brain. Example: Breathing, beating of heart, etc.	2. Reflex actions are controlled by spinal cord. Example: Sneezing, coughing, etc.

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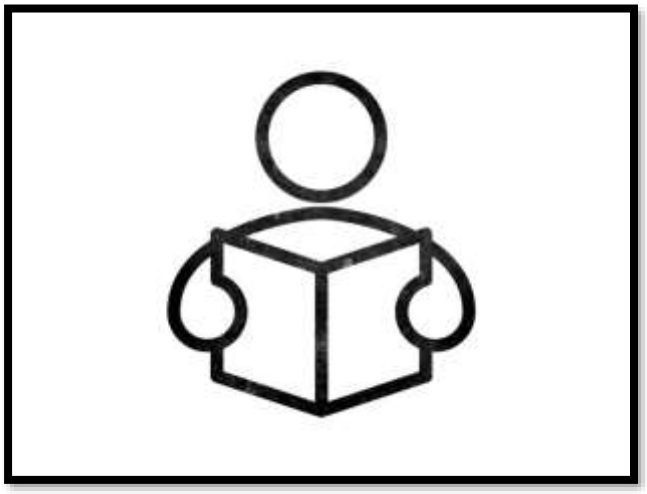

CHAPTER 7 - HOW DO ORGANISMS REPRODUCE?

CH7-SECTION A - MCQ (1 MARKS)

1. The disease kala-azar is caused by a micro-organism known as :

(a) *Planaria* (b) Leech (c) *Leishmania* (d) *Plasmodium*

2. Vegetative propagation refers to the formation of new plants from the following existing organs of the old plants :

(a) stems, roots and flowers (b) stems, roots and leaves

(c) stems, flowers and fruits (d) stems, leaves and flowers

3. An alga which reproduces by the asexual reproduction method called fragmentation is :

(a) *Rhizopus* (b) *Salmonella* (c) *Plasmodium* (d) *Spirogyra*

4. AIDS is a deadly disease which is caused by :

(a) a protozoan (b) a fungus (c) a bacterium (d) a virus

5. In a flower, the parts that produce male and female gametes are respectively :

(a) sepal and anther (b) filament and stigma

(c) anther and ovary (d) stamen and style

6. One of the following process does not lead to the formation of clones. This is :

(a) fission (b) fertilisation (c) fragmentation (d) budding

7. The normal body cell of an organism contains 28 pairs of chromosomes. The number of chromosomes present in its germ cell will be :

(a) 28 (b) 14 (c) 56 (d) 42

8. The characteristics transmitted from parents to offspring are present in :

(a) cytoplasm (b) ribosome (c) golgi bodies (d) genes

9. Fertilisation results immediately in the formation of :

(a) a zygote (b) an embryo (c) a placenta (d) a foetus

10. Which of the following method of contraception protects a person from acquiring a sexually transmitted disease ?

(a) oral pills (b) condoms (c) copper-T (d) surgery

Answers:

1. (c) Leishmania
2. (b) stems, roots and leaves
3. (d) *Spirogyra*
4. (d) a virus
5. (c) anther and ovary
6. (b) fertilisation
7. (b) 14
8. d) genes
9. (a) a zygote
10. (b) condoms

CH7-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS 

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

Q1. Assertion(A) : Asexual reproduction is a primitive type of reproduction.
Reason (R) : Asexual reproduction involves only mitotic cell division.
Answer(a)

Q.2. Assertion(A) : Spores are unicellular bodies.
Reason (R) : The parent body simply breaks up into smaller pieces on maturation.
Answer(c)

Q.3. Assertion(A) : Clones are offspring of an organism formed by asexual reproduction.
Reason (R) : Clones have exact copies of DNA as their parent.
Answer(b)

Q.4. Assertion(A) : Colonies of yeast multiply in sugar solution.
Reason (R) : Sugar is made of sucrose which provides energy for sustaining all life activities.
Answer(a)

Q.5. Assertion(A): Pollen grains from the carpel stick to the stigma of stamen.
Reason (R) : The fertilised egg cells grow inside the ovules and become seeds.
Answer(d)

Q.6. Assertion(A) : The offspring produced by sexual reproduction is likely to adjust better in environmental fluctuation.
Reason (R) : During the fusion of gametes there is mixing of genetic material from two parents.
Answer(a)

Q.7. Assertion(A) : Growth hormone stimulates the growth of different body parts.
Reason (R) : Gonadotropins stimulate the production of sex hormones.
Answer(b)

Q.8. Assertion(A): Testes lie in penis outside the body.
Reason (R) : Sperms require temperature lower than the body temperature for development
Answer(d)

Q9. Assertion (A): Amoeba reproduces by binary fission.
Reason (R): All unicellular organisms reproduce asexually.
ans Both A and R are true and R is the correct explanation of A.

Q10. Assertion (A): In human male, testes are extra abdominal organs which are present inside scrotum.
Reason (R): Scrotum has a relatively lower temperature needed for the production and storage of sperms.
ANS- Both A and R are true and R is the correct explanation of A

CH7-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

3. Can a woman get pregnant after menopause? Why/ why not?

Ans- NO, a woman cannot get pregnant after menopause as she stops ovulation and without egg there can't be fertilization

4. How is father responsible for the sex determination of baby?

Ans- father has two chromosomes, X and Y. MOTHER ALWAYS PRODUCES X CHROMOSOMES. SO, IT'S FATHER'S CHROMOSOMES THAT DETERMINE THE SEX OF THE BABY.

5. What is the significance of corolla and calyx in reproduction?

Ans- corolla attracts insects for pollination and calyx protects the flower in bud stage.

CH7-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

Question 1

What is the importance of DNA copying in reproduction?

Answer:

DNA copying has following importance in reproduction:

It maintains the characteristics of species.It maintains the continuity of life.From this, the characteristics and features of organisms are transformed to their progeny.

It produces variations in organisms which is the basis of evolution of new species.

Question 2, Why is variation beneficial to the species but not necessarily for the individual?

Answer:The various populations of organisms interact with many types of ecological niches. This is important for them to survive in given conditions. In case of any damage caused to the ecological conditions of the population, the population gets adversely affected. The organisms which are able to survive, may reproduce to develop population which is adapted or suited to the varied conditions. Hence variation is beneficial to species, but not to the individuals.

Question 3, How is the process of pollination different from fertilisation ?

Answer: Binary fission Multiple fission

1. In this an organism divides into two similar organisms. 1. In this an organism produces two or more organisms.

2. A cyst or thick layer is not formed around the cell. 2. A cyst or thick layer is formed around the cell.

It generally occurs in favourable conditions

Example : Amoeba, paramecium3. It can take place in unfavourable conditions too.

Example: Malarial parasite.

Question 4, How will an organism be benefited if it reproduces through spores ?

Answer:

An organism is benefited by reproducing through the spores because spores are surrounded by a thick layer which protects them in adverse conditions. When the favourable conditions occur, these spores start to grow again. In this way they are successfully live in unfavourable conditions.

Question 5: Why is vegetative propagation practised for growing some types of plants ?

Answer:Vegetative propagation is practiced for growing such plants which usually do not produce seeds or produce non-viable seeds.

CH7-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

CASE STUDY BASED QUESTIONS:

1 Germination starts with the rapid intake of water by the seed through its micropyle. The first visible indication of germination is the swelling of the seed with a resultant increase in weight. It is also accompanied by the softening of the seed coat. Absorption of water causes a number of physiological changes in the seed. Germinating seeds exhibit increased respiratory activity. The embryo produces enzymes which convert the food materials stored in the cotyledons into soluble form usable by the growing embryo. Once the food is made available, cell division activity starts in the growing embryo. The growth of the embryonic tissue ruptures the seed coat.

(i) Which of the following is not connected with the germination of seed.

(a) It swells

(b) The seed coat softened

(c) It exhibits photosynthesis

(d) It exhibits respiration

(ii) Which among the following are true

(i) Radicle develops into root

(ii) Radicle develops into shoot

(iii) Plumule develops into root

(iii) Plumule develops into shoot

(a) (i) and (ii)

(b) (i) and (iii)

(c) (i) and (iv)

(d) (ii) and (iv)

(iii) Which of the following is a part of seed.

(a) Embryo (b) Radicle

(c) Plumule (d) All of the above

(iv) The condition needed for the germination of the seed

(a) Moisture (b) Temperature

(c) Both (A)and (b)

(d) None of the above

2 The growing size of the human population is a cause of concern for all people. The rate of birth and death in a given population will determine its size. Reproduction is the process by which organisms

increase their population. The process of sexual maturation for reproduction is gradual and takes place while general body growth is still going on. Some degree of sexual maturation does not n ecessarily mean that the mind or body is ready for sexual acts or for having and bringing up children. Various contraceptive devices are being used by human beings to control the size of population.

1) What should be maintained for healthy society?

a) Rate of birth and death rate

b) Male and female sex ratio

c) Child sex ratio

d) None of these

2) Which contraceptive method changes the hormonal balance of the body?

a) Condoms

b) Diaphragms

c) Oral pills

d) Both a) and b)

3) Common sign of sexual maturation in girls is

a) Low pitch voice

b) Appearance of moustache and beard

c) Development of mammary glands

d) Broadening of shoulders

4) What are common signs of sexual maturation in boys?

a) Broadening of shoulders

b) Development of mammary glands

c) Broadening of waist

d) High pitch of voice

CH7-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Question 1, Can you think of reasons why more complex organisms cannot give rise to new individuals through regeneration ?

Answer:

In complex multicellular organisms, specialised cells make up tissues, tissue make up organs, organs make up organ systems and finally organ systems make up organisms. Since complex multicellular organisms have a very high degree of organisation in their body, they cannot be reproduced from their cut body parts by the process of regeneration.

For example, a dog is a complex multicellular organism which cannot be regenerated from its cut body part say, a cut tail. This is because the cells present in the cut tail of a dog cannot produce dog's organs like heart brain, lungs, stomach, intestines and limbs, etc, needed for the making of a complete dog.

Question 2:What is the importance of DNA copying in reproduction?

Answer:

DNA copying has following importance in reproduction:

It maintains the characteristics of species.

It maintains the continuity of life.

From this, the characteristics and features of organisms are transformed to their progeny.

It produces variations in organisms which is the basis of evolution of new species.

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cell.
It generally occurs in favourable conditions
Example : Amoeba, paramecium3. It can take place in unfavourable conditions too.
Example: Malarial parasite.

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Question 5: Why is DNA copying an essential part of the process of reproduction ?
Answer:
DNA copying is essential part of the process of reproduction so that the characteristics of the parent organisms are transmitted to its offspring and at the same time some occasional variations are also produced in the offspring. The changes in the copy of DNA provide an organism the capability to survive in changing conditions.
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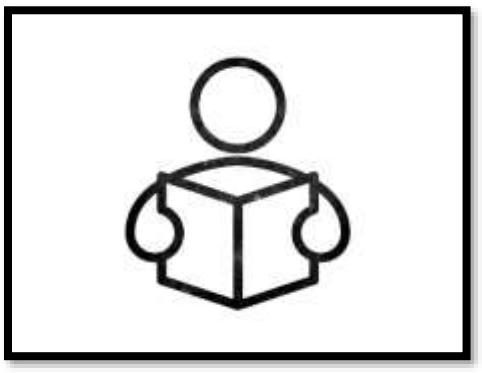


CHAPTER 8 - HEREDITY

CH8-SECTION A - MCQ (1 MARKS)

1. The human animal which has an XY pair of chromosomes is called :

(a) male (b) hybrid (c) female (d) transexual

2. The two versions of a trait (character) which are brought in by the male and female gametes are situated on :

(a) copies of the same chromosome (b) sex chromosomes

(c) two different chromosomes (d) any chromosomes

3. The exchange of genetic material takes place in :

(a) vegetative reproduction (b) asexual reproduction

(c) sexual reproduction (d) budding

4. A trait in an organism is influenced by :

(a) paternal DNA only (b) maternal DNA only

(c) both maternal and paternal DNA (d) neither by paternal nor by maternal DNA

5. A zygote which has inherited an X chromosome from the father will develop into :

(a) baby boy (b) baby girl (c) adult (d) either boy or girl

6. If the ratio of each phenotype of the seeds of pea plants in the F2 generation is 9 : 3 : 3 : 1, it is known as :

(a) tetrahybrid ratio (b) monohybrid ratio (c) dihybrid ratio (d) trihybrid ratio

7. The visible characteristic in an organism is known as :

(a) genotype (b) acquired character (c) phenotype (d) none of the above

8. Which of the following statement is **incorrect**?

(a) For every hormone there is a gene. (b) For every protein there is a gene.

(c) For production of every enzyme there is a gene. (d) For every molecule of fat there is a gene .

9. In human males all the chromosomes are paired perfectly except one. This/these unpaired chromosome is/are

(i) large chromosome (ii) small chromosome (iii) Y-chromosome (iv) X-chromosome

(a) (i) and (ii)

(b) (iii) only

(c) (iii) and (iv)

(d) (ii) and (iv)

10. The maleness of a child is determined by

(a) the X chromosome in the zygote (b) the Y chromosome in zygote

(c) the cytoplasm of germ cell which determines the sex (d) sex is determined by chance

Answers

1. (a) male

2.(a) copies of the same chromosome

3.c) sexual reproduction

4.(c) both maternal and paternal DNA

5. (b) baby girl

6. (c) dihybrid ratio

7. c) phenotype

8. (d) For every molecule of fat there is a gene

9. (c) (iii) and (iv)

10. (b) the Y chromosome in zygote

CH8-SECTION B - ASSERTION AND REASON QUESTIONS (1 MAR

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

Q1. Assertion(A): A geneticist crossed two pea plants and got 50% tall and 50% dwarf in the progeny.
Reason (R) : One plant was heterozygous tall and the other was dwarf.
Answer: (a)

Q2. Assertion: A child which has inherited X chromosome from father will develop into a girl child.
Reason: Girl child inherits X chromosome from father and Y chromosome from mother
ANSWER- C

Q3. Assertion : In humans, male (or father) is responsible for sex of the baby which is born.
Reason: Y chromosomes are present in only male gametes or sperms.
ANSWER - A

Q4. Assertion : When pea plants (pureline) having round yellow seeds are crossed with pureline plants having wrinkled green seeds, then all pea plants obtained in F, generation bear wrinkled green seeds.
Reason: Round and yellow seeds are dominant to wrinkled and green seeds.
ANSWER- D

Q5. Assertion : Monohybrid cross deals with inheritance of one pair of contrasting characters.
Reason: Dihybrid cross deals with inheritance of two pairs of contrasting characters.
ANSWER- B

Q6. Assertion : Accumulation of variation in a species increases the chances of its survival in changing environment.
Reason : Accumulation of heat resistance in some bacteria ensure their survival even when temperature in
environment rises too much.
Answer: (b)

Q7. Assertion(A) : Geographical isolation cannot be a major factor in speciation of an asexually reproducing organism.
Reason (R) : Asexually reproducing organisms do not require any other organism for reproduction.
Answer: (a)

Q8. Assertion(A): The sex of a child is determined by the mother.
Reason (R) : Humans have two types of sex chromosomes: XX and XY.
Answer: (d)

Q9. Assertion(A): Mendel selected the pea plant for his experiments.
Reason (R) : Pea plant is cross-pollinating and has unisexual flowers.
Answer: (a)

Q10. Assertion(A) : Variations are seen in offspring produced by sexual reproduction.
Reason (R) : DNA molecule generated by replication is not exactly identical to original DNA.
Answer: (a)

CH8-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

.Q:1. Mendel crossed a pure tall pea plant (TT) with pure short pea plant (tt) and obtained all tall plants in F1 generation

a. What is the gene combination present in the plants of F1 generation

,b. Give reason why only tall plants are observed in F1 progeny

Answer: (a) Tt

(b) Tall plants are observed in F1 progeny as tallness is a dominant trait.

Q:2. A woman has only daughters. Analyse the situation genetically and provide a suitable explanation.

Ans. The women produces ova with both 'X' ehromosome and man produces sperms with X and Y chromosome. If the husband of the woman transfer X chromosome, then child will be a girl. On the other hand, if the husband transfer Y chromosome, the child will be a boy. In the case, the husband is always transferring X chromosome and hence, all the children are girl.

Q:3. The sex of the children is determined by what they inherit from their father and not their mother." Justify.

Ans. It is because a child who inherits an X chromosome from father will be a girl and one who inherits a Y chromosome from father will be a boy. But all children will inherit an X chromosome from their mother regardless of whether they are boys or girls.

Q:4. What is a sex chromosome?

Ans. Sex chromosome is a chromosome that operates in the sex-determining mechanism of a species. Many animals have two different types of sex chromosomes. For example, in humans there is a large X chromosome and a much smaller Y chromosome.

Q:5 In pea plants ,in the cross between RrYy (Round, yellow), what are the combinations of character in the F_2 progeny? What are their ratios?

Ans. Round yellow-9 : Round green-3

Wrinkled yellow-3: Wrinkled green - 1

i.e. 9:3:3:1.

CH8-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

1.How does the creation of variations in a species promote survival?

Solution: Genetic variations enable the species to better adapt to changes in its environment. Moreover, it is an important force in evolution as it allows the frequency of alleles to increase or decrease through natural selection. These variations will determine the difference between extinction or continuation of the species.

2. A man with blood group A marries a woman with blood group O, and their daughter has blood group O. Is this information enough to tell you which of the traits – blood group A or O – is dominant? Why or why not?

Solution: Given information is not enough to tell us which characteristics are dominant – blood group A or O. Blood type A is always dominant in ABO blood, and blood type O is always recessive. Here, the father's blood group may be genotypically AA (homozygous) or AO (heterozygous), whereas that of the mother can be OA or OO.

3.Why are the small numbers of surviving tigers a cause of worry from the point of view of genetics?

Solution:

As the size of the tiger population decreases, the genetic pool of the species decreases too. This results in a limitation on the variations which will be introduced within the genetic makeup of the tigers. This lack of variation will result in serious implications. For example, if an illness spreads within the tiger population, it can potentially wipe out the whole population, possibly causing their extinction.

4.What factors could lead to the rise of a new species?

Solution:Factors that would result in a new species are as follows:

(a) Mutation

(b) Genetic drift

(c) Natural selection

(d) Geographical isolation

(e) Generative isolation for prolonged periods

(f) Environmental factors on the isolated populations

(g) Quantum of genetic variant transmissible from one generation to the following generation

5.A Mendelian experiment consisted of breeding tall pea plants bearing violet flowers with short pea plants bearing white flowers. The progeny all bore violet flowers, but almost half of them were short. This suggests that the genetic makeup of the tall parent can be depicted as

(a) TTWW

(b) TTww

(c) TtWW

(d) TtWw

Solution:

Correct answer – (c)

TtWW might be the genetic makeup of the tall parent. Since half the progenies are short, this implies that the parent plant also will have a collection of short genes; all progenies bore violet flowers, further suggesting that violet colour is dominant over white.

CH8-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

1.Pea plants can have smooth seeds or wrinkled seeds. One of the phenotypes is completely dominant over the other. A farmer decides to pollinate one flower of a plant with smooth seeds using pollen from a plant with wrinkled seeds. The resulting pea pod has all smooth seeds.

i) Which of the following conclusions can be drawn?

(1) The allele for smooth seeds is dominated over that of wrinkled seeds.

(2) The plant with smooth seeds is heterozygous.

(3) The plant with wrinkled seeds is homozygous.

(a) 1 only (b) 1 and 2 only

(c) 1 and 3 only (d) 1, 2 and 3

ii) Which of the following crosses will give smooth and wrinkled seeds in same proportion?

(a) RR X rr (b) Rr X rr (C) RRX Rr (d) rr X rr

iii) Which of the following cross can be used to determine the genotype of a plant with dominant phenotype?

(a) RR X RR (b) Rr X Rr

(c) Rr X RR (d) RR X rr

iv) On crossing of two heterozygous smooth seeded plants (Rr), a total of 1000 plants were obtained in F1 generation. What will be the respective number of smooth and wrinkled seeds obtained in F1 generation?

(a) 750, 250 (b) 500, 500

(C) 800, 200 (d) 950, 50

2. In some families , either rural or urban , families are tortured for giving birth to a female child. They do not seem to understand the scientific reason behind the birth of a boy or a girl. In fact the mother is not responsible for the sex of a child and it has been genetically proved that the sex of a newborn is determined by what the child inherits from the father.

a. State that basis on which the sex of a newborn baby is determined in humans.

b. Why is the pair of sex chromosomes called a mismatched pair in males?

c. How is the original number of chromosomes present in the parents restored in the

progeny?

OR

c. Explain by giving two examples of the organisms in which the sex is not genetically determined.

CH8-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Q.1 Explain how sexual reproduction gives rise to more viable variations than asexual reproduction. How does this affect the evolution of those organisms that reproduce sexually?

Solution:

Sexual reproduction causes a lot of viable variations because of the following reasons:

(a) Error in copying of DNA (though it was rare)

(b) Random segregation of paternal and maternal chromosomes at the time of sex cell formation.

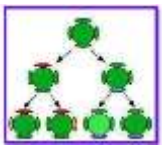
(c) Exchange of genetic material between homologous chromosomes during the formation of gametes.

(d) Accumulation of variations occurred because of reproduction over generation after generation, and choice naturally created wide diversity.

(e) In the case of asexual reproduction, variation is severely limited as there is only one parent involved. Hence, the offspring is genetically similar to the parent

Q.2. If a trait A exists in 10% of a population of an asexually reproducing species and a trait B exists in 60% of the same population, which trait is likely to have arisen earlier?

Solution : In asexual reproduction, the reproducing cells produce a copy of their DNA through some chemical reactions. However, this copying of DNA is not accurate and therefore, the newly formed DNA has some variations.



It can be easily observed in the above figure that in asexual reproduction, very few variations are allowed. Therefore, if a trait is present in only 10% of the population, it is more likely that the trait has arisen recently. Hence, it can be concluded that trait B that exists in 60% of the same population has arisen earlier than trait A.

Q.3. Answer The followings

a. Why is the pair of sex chromosome called a mismatch pair in males
b. If there are 1600 plants obtained in F2 Progeny, write the number of plants having traits-
    1. Tall with round seed
    2. Short with wrinkled seed

c. Write the genotype and phenotype ration of medals Monohybrid cross in F2 generation.

d. What is test cross?

Answers

a. Males sex chromosome are called mismatched pair because one is of a normal size called X Chromosome and other is a short called Y Chromosome.
b. If 1600 plants were obtained in F2 Progeny, the number of plants having traits will be -
    1. Tall plant with round seed

       9/16x1600 = 900
    2. Short plants with Wrinkled seed

       1/16x1600 = 100

c. The genotype ratio is 1:2:1 and the phenotype ratio will be 3:1

d. When F1 generation is crossed with a parent with recessive traits, it is called a test cross.

It helps determine the genetic composition (heterozygous/homozygous) of the progeny.In the given cross the

F1 is heterozygous and so the ratio is 1:1If it were homozygous all the progeny will be of the same phenotype.

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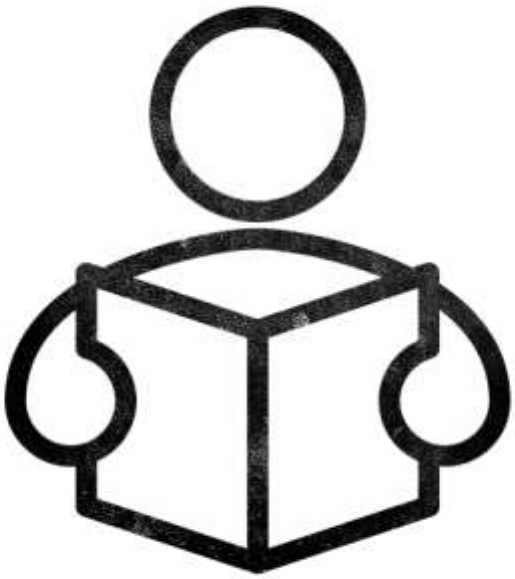


CHAPTER 9 - LIGHT- REFLECTION AND REFRACTION

CH9-SECTION A - MCQ (1 MARKS)

Q1) When a plane mirror is rotated through a certain angle, the reflected ray turns through twice as much and the size of the image:

(a) is doubled

(b) is halved

(c) becomes infinite

(d) remains the same

Correct Answer: Option (d)

Q2) If an object is placed symmetrically between two plane mirrors, inclined at an angle of 72 degrees, then the total no. of images formed is:

(a) 5

(b) 4

(c) 2

(d) infinite

Correct Answer: Option (b)

Q3) Which statement is true for the reflection of light?

(a) The angle of incidence and reflection are equal.

(b) The reflected light is less bright than the incident light.

(c) The sum of the angle of incidence and reflection is always greater than 90^0.

(d) The beams of the incident light, after reflection, diverge at unequal angles.

Correct Answer: Option (a)

Q4) The focal length of a plane mirror is

(a) 0

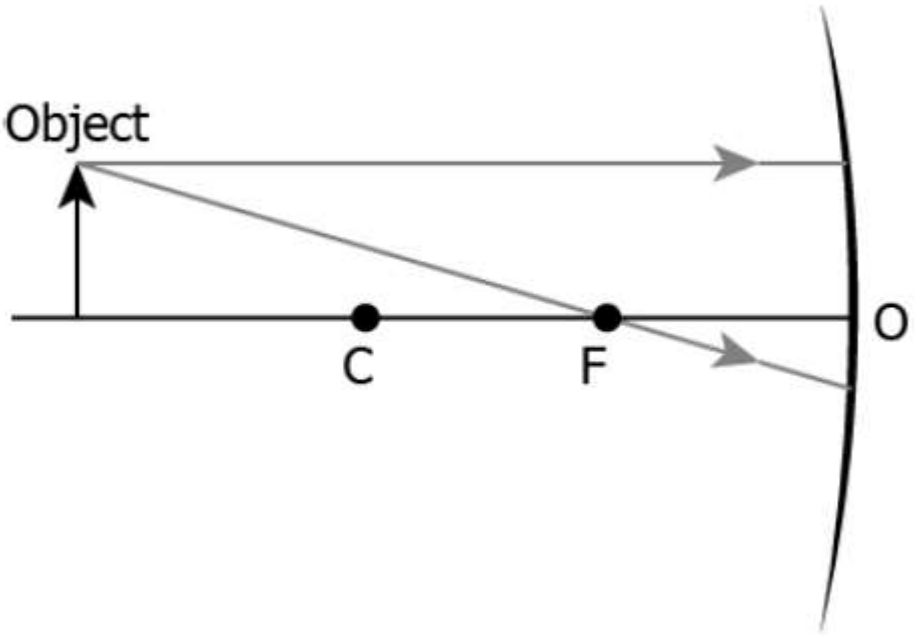
(b) infinite

(c) 25 cm

(d) -25 cm

Correct Answer: Option (b)

Q5) The image shows the path of incident rays to a concave mirror.



Where would the reflected rays meet for the image formation to take place?

(a) Behind the mirror

(b) Between F and O

(c) Between C and F

(d) Beyond C

Correct Answer: Option (c)

Q6) A beam of light incident on a plane mirror forms a real image on reflection. The incident beam is:

(a) parallel

(b) convergent

(c) divergent

(d) not certain

Correct Answer: Option (b)

Q7) An object is placed at a distance of 40cm in front of a concave mirror of a focal length of 20 cm.

The image produced is:

(a) virtual and inverted

(b) real and erect

(c) real, inverted and of the opposite size as that of the object

(d) real, inverted and of the same size as that of the object

Correct Answer: Option (d)

Q8) A student conducts an experiment using a convex lens. He places the object at a distance of 60 cm in front of the lens and observes that the image is formed at a distance of 30 cm behind the lens. What is the power of the lens?

(a) 0.005 dioptre

(b) 0.05 dioptre

(c) 5 dioptre

(d) 50 dioptre

Correct Answer: Option (c)

Q9) An image of an object produced on a screen which is about 36 cm using a convex lens. The image produced is about 3 times the size of the object. What is the size of the object?

(a) 12 cm

(b) 33 cm

(c) 39 cm

(d) 108 cm

Correct Answer: Option (a)

Q10) Image formed by a convex spherical mirror is:

(a) virtual

(b) real

(c) enlarged

(d) inverted

Correct Answer: Option (a)

CH9-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS)

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

Q.1Define 1 dioptre of power of a lens.

Answer-Dioptre is the SI unit of power of lens is denoted by the letter D. 1 dioptre can be defined as the power of a lens of focal length 1 metre.

Q.2 Define the principal focus of a concave mirror.

Answer-Light rays that are parallel to the principal axis of a concave mirror converge at a specific point on its principal axis after reflecting from the mirror. This point is called the principal focus of the concave mirror.

Q.3. The radius of curvature of a spherical mirror is 20 cm. What is its focal length?

Answer-Radius of curvature (R) = 20 cm

Radius of curvature of the spherical mirror = 2 × Focal length (f)

R = 2f

f= R/2 = 20 / 2 = 10

Therefore, the focal length of the spherical mirror is 10 cm.

Q.4. Name the mirror that can give an erect and enlarged image of an object.

Answer-

The mirror that can give an erect and enlarged image of an object is a Concave Mirror.

Q.5. Why do we prefer a convex mirror as a rear-view mirror in vehicles?

Answer-A convex mirror is preferred as a rear-view mirror in cars and vehicles as it gives a wider field of view, which helps the driver see most of the traffic behind him. Convex mirrors always form an erect, virtual, and diminished image of the objects placed in front of it.

CH9-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

Q.1. State the types of mirrors used for (i) headlights and (ii) rear view mirrors, in motorcycles

Answer: (i) Concave mirrors are used in headlights of cars to get powerful beams of light.

(ii) Convex mirrors are used as rear-view mirrors of vehicle to get a wider field of view and erect image of traffic behind.

Q. 2. List four characteristics of the images formed by plane mirrors.

Answer: Characteristics of the image formed by a plane mirror are

(i) image formed is virtual and erect

(ii) image formed is of the same size as that of the object

(iii) image formed is laterally inverted (left appears right and right appears left).

Q.3. State the two laws of reflection of light.

Answer: Laws of reflection of light states that

(i) The angle of incidence is equal to the angle of reflection.

(ii) The incident ray, the reflected ray and the normal to the mirror at the point of incidence all lie in the same plane.

Q.4 What is the magnification of the images formed by plane mirrors and why?

Answer: Magnification of images formed by plane mirrors is unity because for plane mirrors, the size of the image formed is equal to that of the object.

Q.5 Define the radius of curvature of spherical mirrors.

Answer: Radius of Curvature: The radius of the sphere of which the reflecting surface of a spherical mirror forms a part, is called the radius of curvature of the mirror. It is represented by the letter R.

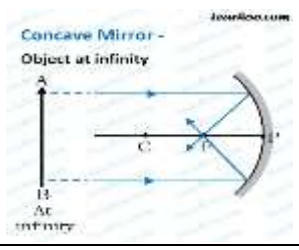
CH9-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

1. Name the type of mirrors used in the design of solar furnaces. Explain how high temperature is achieved by this device with the help of ray diagram .

   Answer:

   Concave mirrors are used in the designing of solar furnaces.

   When a solar furnace is placed at the focus of a large concave mirror, it focuses a parallel beam of light on the furnace. Therefore, a high temperature is attained at the point after some time.



2. An object is placed at a distance of 12 cm in front of a concave mirror of radius of curvature 30 cm. List four characteristics of the image formed by the mirror.

   Answer:

   Radius of curvature (R) = 30 cm, object distance is 12 cm in front of the mirror. Thus we can say that object is placed between focus and pole. Four characteristics of the image formed by die given concave mirror when object is placed between pole and focus are:

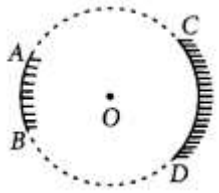
   (i) Virtual

   (ii) Erect

   (iii) Enlarged

   (iv) Image is formed behind the mirror

3. 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?



   Answer:

   Focal length of a mirror is given by

   Focal length = Radiusofcurvature2

   Since both the mirrors have same radius of curvature, therefore focal length of the two mirrors will be same, i.e.,

   f1/f2 = 1/1

   Since virtual image is always formed by convex mirror. The mirror AB will always form virtual image.

CH9-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

CASE 1

As we know that, in case of concave mirrors when a ray of light parallel to principal axis strikes the mirror and after reflection it passes through principal focus of the concave mirror. Also, a ray which is passing through the principal focus of the concave mirror after reflection goes parallel to the principal axis. And the ray of light which is passing through the centre of curvature of concave mirror after reflection retraces the same path in backward direction. Because of converging property of concave mirrors they are used in solar furnaces to concentrate more light to produce huge amount of heat energy. They are also used in search lights, torches, head lights of vehicles so that a strong parallel beam of light will be produced. Also, in case of shaving mirrors concave mirrors are used to see larger face of the person.

While convex mirrors are used as rear view mirror in vehicles to see the traffic behind the person for safe driving. As these mirrors are curved outwards they has wider field of view. In convex mirrors the image formed is always diminished, virtual and erect.

In concave mirror, when the object is at infinity the image formed will be at focus F and which is highly diminished, point sized, real and inverted

Questions:

1) In case of concave mirror when the image formed is virtual and erect?

2) In which case the image formed is of same size as the object in case of concave mirrors?

3) Which mirrors are called as converging and diverging mirror?

4) The focal length of concave mirror is_____ and the focal length of convex mirror is _____.

Answers:

1) In case of concave mirrors, when the object is placed between pole P and focus F of the mirror then the image formed is behind the mirror which is enlarged, virtual and erect.

2) When the object is placed at centre of curvature C of the mirror then image formed is also at centre of curvature C which is of same size, real and inverted.

3) Concave mirror is called as converging mirror while convex mirror is called as diverging mirror.

4) The focal length of concave mirror is positive and the focal length of convex mirror is negative

CASE 2

We have, the object distance is the distance of the object from the pole of the mirror. And we always know that object is placed in front of mirror that means on left side and hence object distance u is

always taken as negative. The distance of the image from the pole of the mirror is taken as image distance. The image distance may be positive or negative on the basis of nature of image formed. And the distance of principal focus from the pole is called as focal length of the mirror. Thus, the relationship between the object distance u, image distance v and focal length f is given by mirror formula.

Thus,

Mirror formula:

1/v + 1/u = 1/f

And magnification in case of mirror gives the extent to which the image is magnified as compared to object size. Magnification is given by the ratio of height of image (h') to the height of object (h).

Thus, magnification = (height of image)/(height of object)

Thus, **m = h'/h**

Also, in terms of object distance and image distance magnification is given by,

Magnification m = h'/h = -v/u

As we know that, image height is positive if the image formed is virtual while height of image is negative for real images.

Similarly in case of lenses, lens formula is given by

1/v – 1/u = 1/f

And magnification in case of lenses is given by

Magnification **m = h'/h = v/u**

The power of lens depends on the focal length of the lens and it is the ability of the lens to diverge or converge the number of rays incident on it. Also, power of lens is defined as the reciprocal of focal length of the lens.

Thus, **P = 1/f**

Questions:

1) If the focal length of the lens is measured in meter what will be the unit of power of lens?

2) What is the sign of power of convex and concave lens?

3) If the lenses placed in contact of powers P1, P2, P3, P4 are used then what is the net power of lens system?

4) If the magnification produced is negative and positive in case of mirrors then what about the nature of images formed there?

Answers

1) If the focal length of the lens is used in meter then the power of the lens is measured in dioptre or D

or m-1.

2) As the focal length of convex lens is positive and hence the power of convex lens is positive. Also, as the focal length of concave lens is negative and hence the power of concave lens is negative.

3) If in a lens system four lenses of power P1, P2, P3 and P4 are in contact then net power of lens system is the algebraic sum of given power of lenses.

P= P1 + P2 + P3 + P4

4) If the magnification produced is negative then the image formed is real. And if the magnification produced is positive then the image formed is virtual.

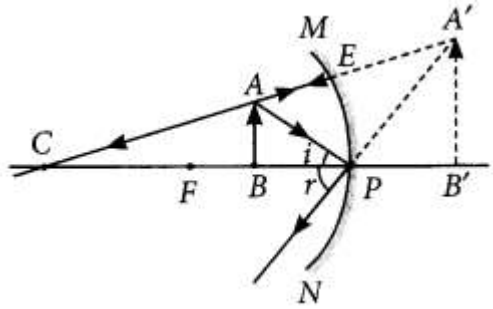
CH9-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

1. a. List two possible ways in which a concave mirror can produce a magnified image of an object placed in front of it. State the difference if any between these two images. Also draw ray diagram (3)

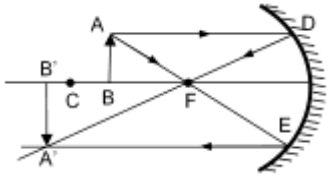
   Answer:

   A concave mirror can produce a magnified image of an object when object is placed:

   (1) In between its pole and its focus



   (2) In between its focus and its centre of curvature.



   Difference, between these two images:

   The image produced in first case will be virtual and erect.

   The image produced in second case will be real and inverted.

   b. A concave mirror has a focal length of 20 cm. At what distance from the mirror should a 4 cm tall object be placed so that it forms an image at a distance of 30 cm from the mirror?

Also calculate the size of the image formed. (2)

Answer:

Given f = -20 cm v = -30 cm u = ?

Using 1/v + 1/u = 1/f

1/u = 1/f – 1/v = 1/−20 – 1/−30 = −3/+2/60

⇒ u = -60 cm

∴ Object placed at 60 cm from the mirror.

Also magnification, m = h′/h = −vu

⇒ h’ = −(−30)/−60 × 4 = -2 cm

∴ The size of the image is 2 cm.

2. a. A security mirror used in a big showroom has radius of curvature 5 m. If a customer is standing at a distance of 20 m from the cash counter, find the position, nature and size of the image formed in the security mirror. (3)

Answer:

(a) Given radius of curvature of the mirror,

R = 5 m

∴ Focal length, f = R/2 = 2.5 m (convex mirror) and u = -20 m

From mirror formula,

1/f=1/v+1/u or 1/v=1/f−/u

= 1/2.5−1/−20=−20−2.5−20×2.5

∴ v = 2.22 m

Thus, the image is formed 2.22 m behind the mirror. The image is diminished, virtual and erect.

b. Neha visited a dentist in his clinic. She observed that the dentist was holding an instrument fitted with a mirror. State the nature of this mirror and reason for its use in the instrument used by dentist. (2)

Answer:

Concave mirrors are used by dentist. Dentist use it as it is a converging mirror and when used at close range forms a highly enlarged, virtual and erect image of the object.

3. a. Name the type of mirror used in the following situations

(i) Headlights of a car

(ii) Rear-view mirror of vehicle

(iii) Solar furnace (3)

Answer:

(i) Concave mirror

(ii) convex mirror

(iii) Concave mirrors

b. A concave mirror is used for image formation for different positions of an object. What inferences can be drawn about the following when an object is placed at a distance of 10 cm from the pole of a concave mirror of focal length 15 cm?

(a) Position of the image

(b) Size of the image

(c) Nature of the image

Draw a labelled ray diagram to justify your inferences.

Answer:

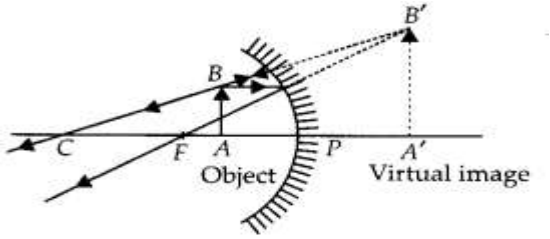
Given, f = -15 cm, u = -10 cm.

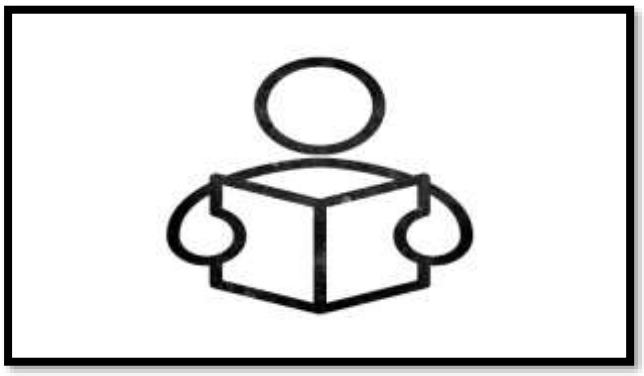
Thus the object is placed between the principal focus and pole of the mirror.

(a) The position of the image will be behind the mirror.

(b) The size of the image will be highly enlarged.

(c) The nature of the image will be virtual and erect.





CHAPTER 10 - THE HUMAN EYE AND THE COLOURFULWORLD

CH10-SECTION A - MCQ (1 MARKS)

1. The image formed by retina of human eye is
   a. Virtual and erect
   b. Real and inverted
   c. Virtual and inverted
   d. Real and erect
2. The change in the focal length of human eye is caused due to
   a. Ciliary muscles
   b. Pupil
   c. Cornea
   d. Iris
3. The least distance of distinct vision for a young adult with normal vision is
   a. 25 m
   b. 20 m
   c. 25 cm
   d. 20 cm
4. The persistence of vision for human eye is
   a. 1/10th of a second
   b. 1/16th of a second
   c. 1/6th of the second
   d. 1/18th of a second
5. The light sensitive cell present on retina and is sensitive to the intensity of light is:
   a. Cones
   b. Rods
   c. Both rods and cones
   d. None of these
6. The phenomena of light responsible for the working of the human eye is
   a. Reflection
   b. Refraction
   c. Power of accommodation
   d. Persistence of vision

7. Which of the following colors is least scattered by fog, dust of smoke?
    a. Violet
    b. Blue
    c. Red
    d. Yellow
8. The colored light that refracts most while passing through a prism is
    a. Yellow
    b. Violet
    c. Blue
    d. Red
9. The amount of light entering the human eye is controlled by
    a. Ciliary muscles
    b. Pupil
    c. Cornea
    d. Iris
10. The part of the eyes refracts light entering the eye from external objects?
    a. Lens
    b. Cornea
    c. Iris
    d. Pupil

ANSWERS

1. B
2. A
3. C
4. B
5. B
6. B
7. C
8. B
9. B
10. B

CH10-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARK)

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

Q.1. Assertion(A) : White light is dispersed into its seven-colour components by a prism.

Reason (R) : Different colours of light bend through different angles with respect to the incident ray as they pass through a prism.

ANS- A

Q.2. Assertion(A) : The phenomenon of scattering of light by the colloidal particles gives rise to Tyndall effect.

Reason (R): The colour of the scattered light depends on the size of the scattering particles.

ANS-A

Q.3. Assertion(A) : A rainbow is sometimes seen in the sky in rainy season only when observer's back is towards the Sun.

Reason (R) : Internal reflection in the water droplets cause dispersion and the final rays are in backward direction.

ANS- A

Q.4 **Assertion(A):** Hypermetropia is the defect of the eye in which only farther objects are seen.

Reason (R) : Hypermetropia is corrected by using converging lens.

ANS-B

Q.5. Assertion(A) : Danger signals are made of red colour.

Reason (R) : Velocity of red light in air is maximum, so signals are visible even in dark.

ANS- C

Q.6 Assertion (A) : Blue colour of sky appears due to scattering of blue colour.

Reason (R) : Blue light has longer wavelength.

ANS- C

Q.7. Assertion(A): The Sun appears flattened at sunrise and sunset.

Reason (R) : The apparent flattering of the Sun's disc at sunrise and sunset is due to atmospheric

refraction.

ANS- A

Q.8. Assertion(A): The sky looks dark and black instead of blue in outer space.

Reason (R) : No atmosphere containing air in the outer space to scatter sunlight.

ANS- A

Q.9. Assertion (A): The stars twinkle, while the planets do not.

Reason (R) : The stars are much bigger in size than the planets.

ANS-B

Q.10. Assertion (A) : Myopia is the defect of the eye in which only nearer objects are seen by the eye.

Reason (R) : The eye ball is elongated.

ANS- A

CH10-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

Q.1 State one function of iris in human eye. (AI 2012)

Answer: Irish a dark muscular diaphragm that controls the size of the pupil.

Q2.State one function of the crystalline lens in the human eye. (Foreign 2012)

Answer:The crystalline lens of human eye focuses the light that enters the eye and form the image on the retina.

Q3.Define the term power of accommodation.

Answer The ability of the eye lens to adjust its focal length is called power of accommodation.

Q.4State the function of each of the following parts of human eye:

(i) Cornea

(ii) Iris

(iii) Pupil

Answer: (i) Cornea : It is a transparent bulge on the front surface of eyeball which refracts most of the light rays entering the eye.

(ii) Iris : Refer to answer 1.

(iii) Pupil: It controls the amount of light entering into the eye.

Q.5List two causes of hypermetropia.

Answer: Hypermetropia is caused due to following reasons:

(i) Shortening of the eyeball

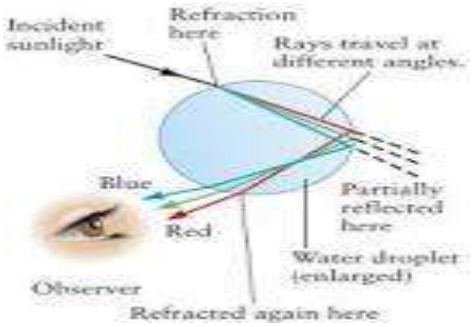
(ii) Focal length of crystalline lens is too long.

CH10-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

1. What is rainbow? When and where do we see a rainbow? How is a rainbow formed ? Draw a labelled diagram to illustrate the formation of a rainbow.

   ANSWER:

   A rainbow is a natural spectrum appearing in the sky after a rain shower. It is caused by dispersion of sunlight by tiny water droplets, present in the atmosphere. A rainbow is always formed in a direction opposite to that of the Sun. The water droplets act like small prisms.

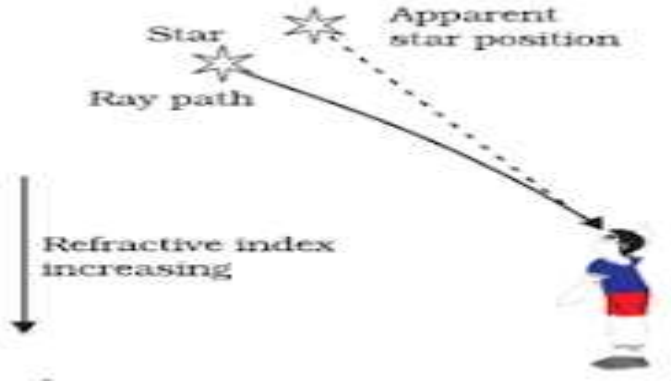


2. **Explain with the help of a labelled diagram ,the cause of twinkling of stars .**

   ANSWER:

Light coming from the stars undergoes refraction on entering the Earths atmosphere. This refraction continues until it reaches the Earths surface. This happens because of uneven heating of atmospheric air. Hence the atmospheric air has to change refractive index at various altitudes. In this case starlight continuously travels from a rarer medium to a denser medium. Hence it continuously bends towards the normal.The refractive index of air medium gradually increases with a decrease in altitude. The continuous bending of starlight towards the normal results in a slight rise of the apparent position of

the star.Since the physical conditions of the Earths atmosphere keep changing the apparent position of the star is not stationary. The star changes its position continuously which makes it twinkle. This happens because starlight travels a very large distance before reaching the observer. However the path varies continuously because of uneven atmospheric conditions. Hence the stars seem to be fluctuating sometimes appearing brighter and sometimes fainter. All this together gives rise to the twinkling effect of stars.



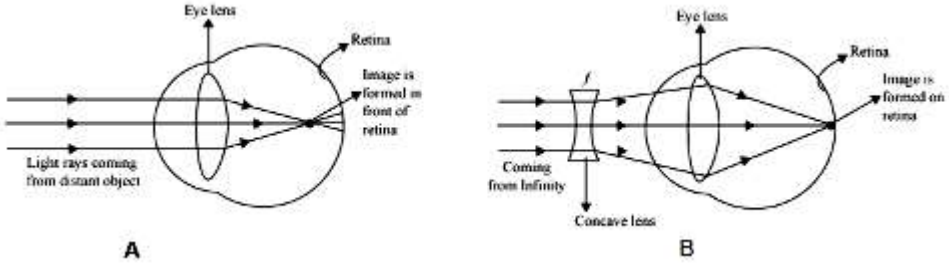
3. **State reasons for Myopia with the help of ray diagram, show the**
   a. **Image formation by a myopic eye**
   b. **Correction of myopia using an appropriate lens.**

ANSWER:

Myopia is a defect of vision in which a person clearly sees all the nearby objects, but is unable to see the distinct object comfortably and his eye is known as myopia eye. A myopic eye has its far pint near that infinity. It forms the image of an distinct object in front of the retina as shown in the figure A. Myopia can be caused by

1. increase in curvature if the lens.
2. increase in the length if the eye ball.

Since concave lens has an ability to diverge incoming rays, it us used to correct this defect of vision. The image is allowed to form at thee retina by using a concave lens of suitable power



CH10-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

we know that, in case of concave mirrors when a ray of light parallel to principal axis strikes the mirror and after reflection it passes through principal focus of the concave mirror. Also, a ray which is passing through the principal focus of the concave mirror after reflection goes parallel to the principal axis. And the ray of light which is passing through the centre of curvature of concave mirror after reflection retraces the same path in backward direction. Because of converging property of concave mirrors they are used in solar furnaces to concentrate more light to produce huge amount of heat energy. They are also used in search lights, torches, head lights of vehicles so that a strong parallel beam of light will be produced. Also, in case of shaving mirrors concave mirrors are used to see larger face of the person.

While convex mirrors are used as rear view mirror in vehicles to see the traffic behind the person for safe driving. As these mirrors are curved outwards they has wider field of view. In convex mirrors the image formed is always diminished, virtual and erect.

In concave mirror, when the object is at infinity the image formed will be at focus F and which is highly diminished, point sized, real and inverted

Questions:

1) In case of concave mirror when the image formed is virtual and erect?

2) In which case the image formed is of same size as the object in case of concave mirrors?

3) Which mirrors are called as converging and diverging mirror?

4) The focal length of concave mirror is_____ and the focal length of convex mirror is _____.

Answers:

1) In case of concave mirrors, when the object is placed between pole P and focus F of the mirror then the image formed is behind the mirror which is enlarged, virtual and erect.

2) When the object is placed at centre of curvature C of the mirror then image formed is also at centre of curvature C which is of same size, real and inverted.

3) Concave mirror is called as converging mirror while convex mirror is called as diverging mirror.

4) The focal length of concave mirror is positive and the focal length of convex mirror is negative

CASE 2

We have, the object distance is the distance of the object from the pole of the mirror. And we always know that object is placed in front of mirror that means on left side and hence object distance u is always taken as negative. The distance of the image from the pole of the mirror is taken as image

distance. The image distance may be positive or negative on the basis of nature of image formed. And the distance of principal focus from the pole is called as focal length of the mirror. Thus, the relationship between the object distance u, image distance v and focal length f is given by mirror formula.

Thus,

Mirror formula:

1/v + 1/u = 1/f

And magnification in case of mirror gives the extent to which the image is magnified as compared to object size. Magnification is given by the ratio of height of image (h') to the height of object (h).

Thus, magnification = (height of image)/(height of object)

Thus, **m = h'/h**

Also, in terms of object distance and image distance magnification is given by,

Magnification m = h'/h = -v/u

As we know that, image height is positive if the image formed is virtual while height of image is negative for real images.

Similarly in case of lenses, lens formula is given by

1/v – 1/u = 1/f

And magnification in case of lenses is given by

Magnification **m = h'/h = v/u**

The power of lens depends on the focal length of the lens and it is the ability of the lens to diverge or converge the number of rays incident on it. Also, power of lens is defined as the reciprocal of focal length of the lens.

Thus, **P = 1/f**

Questions:

1) If the focal length of the lens is measured in meter what will be the unit of power of lens?

2) What is the sign of power of convex and concave lens?

3) If the lenses placed in contact of powers P1, P2, P3, P4 are used then what is the net power of lens system?

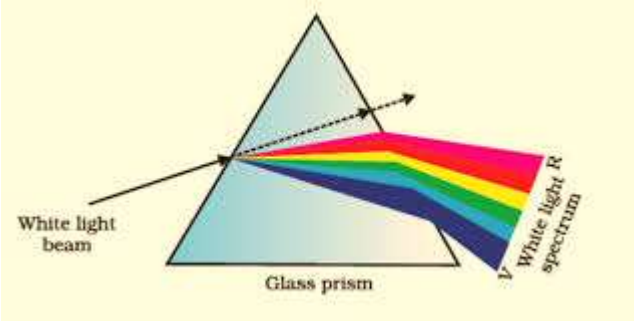
4) If the magnification produced is negative and positive in case of mirrors then what about the nature of images formed there?

Answers

1) If the focal length of the lens is used in meter then the power of the lens is measured in dioptre or D or m-1.

2) As the focal length of convex lens is positive and hence the power of convex lens is positive.
Also, as the focal length of concave lens is negative and hence the power of concave lens is negative.
3) If in a lens system four lenses of power P1, P2, P3 and P4 are in contact then net power of lens system is the algebraic sum of given power of lenses.
P= P1 + P2 + P3 + P4
4) If the magnification produced is negative then the image formed is real. And if the magnification produced is positive then the image formed is virtual.

When a ray of light incident on a prism it will split in seven colours that is called dispersion of light. A prism is a transparent refracting body bounded by plane faces which are inclined to each other at a particular angle called angle of prism.. When a ray of light passes through a prism, it suffers refraction twice and hence the ray deviates through a certain angle from its original path. The angle between the incident ray and emergent ray is called angle of deviation.



i. For which colour the angle of deviation is minimum?

a Red

b Blue

c Violet

d Yellow

Answer a

ii When a white light falls on a prism, the ray at its surface suffers:

(A) Refraction only

(B) dispersion only

(C) deviation only

(D) all of above

Answer d

iii In nature, dispersion of light is happening in

(A) Blue colour of sky

(B) Formation of rainbow

(C) Twinkling of stars

(D) advance sunrise

Answer b

iv The cause of dispersion of light is –

(A) All colours of light travel with the speed more than the speed of light

(B) All colours have different angle of deviation

(C) All the colours of light do not travel with same speed

(D) All the colours have same wavelength

Answer c

CASE 2

One of nature's most splendid masterpieces is the rainbow. A rainbow is an excellent demonstration of the dispersion of light and one more piece of evidence that visible light is composed of a spectrum of wavelengths, each associated with a distinct colour. To view a rainbow, the sun must be at your back as you look at an approximately 40 degree angle above the ground into a region of the atmosphere with suspended droplets of water or even a light mist. Each individual droplet of water acts as a tiny prism that both disperses the light and reflects it back to your eye.

i) Formation of rainbow involves some natural phenomena which are in the correct order respectively is

a)refraction, dispersion, internal reflection and refraction

b)refraction, dispersion, internal reflection

c)reflection, refraction ,dispersion and refraction

d) dispersion , reflection, refraction and internal reflection

Answer a

ii) During the formation of a rainbow the position of observer and sun is

a) Observer behind sun

b) sun behind the observer

b) Observer facing sun

d) at any position

Answerb

iii) During the formation of rainbow, dispersion of sunlight is done by

a) tiny air molecules

b) dust particles of atmosphere

c) tiny droplets of rain water suspended in air

d) air and water

Answer c

iv)The dispersion of light into its components by prism is due to

a) each component get deviated by the same angle by refraction

b) each component gets deviated by a different angle by refraction

c)reflection of each component light by different angle

d)reflection of each component light by same angle

Answer b

CH10-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

1. List three common defects of vision . suggest the way of correcting these defects

ANSWER:

Three common refractive defects of vision are :

1. Myopia, also known as near-sightedness and short-sightedness, is a condition of the eye where the light that comes in does not directly focus on the retina but in front of it, causing the image that one sees when looking at a distant object to be out of focus.

2.Hypermetropia - A defect of the eye that causes light to focus behind the retina instead of directly on it, resulting in an inability to see near objects clearly

3.Presbyopia - is part of the natural aging process of the eye

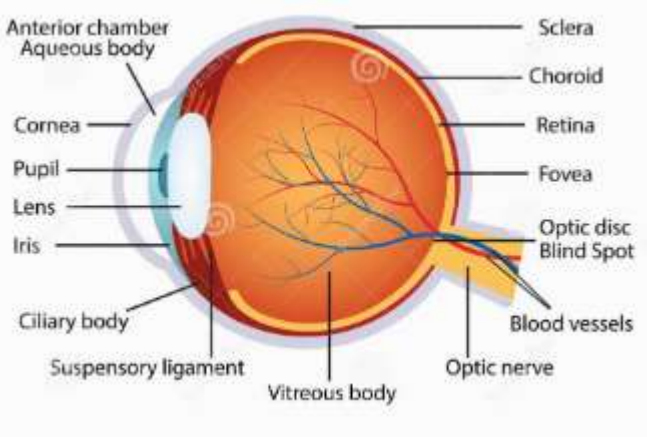
1.Myopia is corrected by using a concave lens of appropriate power

2. Hypermetropia is corrected by using a convex lens of appropriate power.

3. Presbyopia cannot be cured. Instead, prescription glasses, contact lenses, reading glasses, progressive addition lenses, or bifocals can help correct the effects of presbyopia.

2. Draw a labeled diagram of the human eye. Write functions of following parts ciliary muscle , iris, lens ,retina

ANSWER:



Iris - The iris is a thin, circular structure in the eye, responsible for controlling the diameter and size of the pupil and thus the amount of light reaching the retina.

Ciliary Muscles - The ciliary muscle is a ring of smooth muscle in the eye's middle layer (vascular layer) that controls accommodation for viewing objects

Retina - The retina is a thin layer of tissue that lines the back of the eye on the inside. It is located near the optic nerve. The purpose of the retina is to receive light that the lens has focused, convert the light into neural signals, and send these signals on to the brain for visual recognition.

Eye - lens - The lens is located in the eye. By changing its shape, the lens changes the focal distance of the eye.

3 a. A person may suffer from both myopia and hypermetropia defects.

(a) What is this condition called?

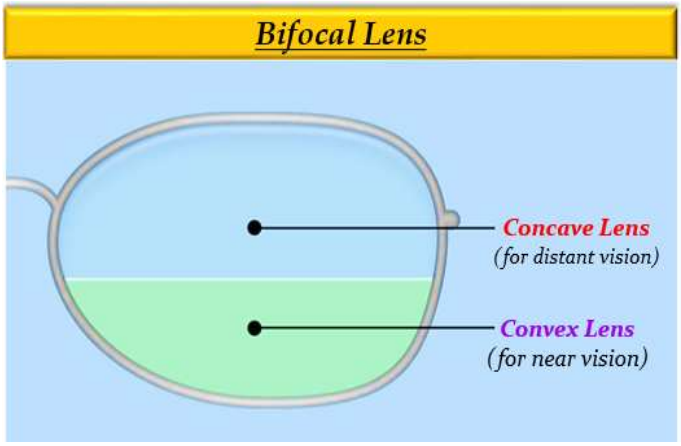
(b) When does it happen?

(c) Name the type of lens often required by the persons suffering from this defect. Draw labelled diagram of such lenses.

ANSWER: **a)** This condition is called **Presbyopia.**

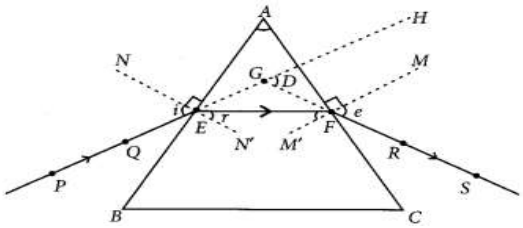
(b) This defect occurs in old age due to the gradual weakening of the ciliary muscle and the eye-lens becoming inflexible (or rigid).

(c) The type of lens often required by the persons suffering from this defect is a **bifocal lens**.



b.Draw a ray diagram to show the refraction of light through a glass prism. Mark on it (a) the incident ray, (b) the emergent ray and (c) the angle of deviation

ANSWER:



i = angle of incidence

(a) PE = incident ray

(b) FS = emergent ray

(c) ∠D = angle of deviation

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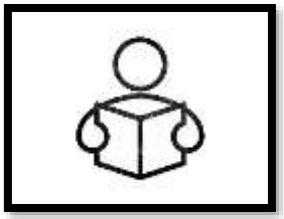


CHAPTER 11 - ELECTRICITY

CH11-SECTION A - MCQ (1 MARKS)

Q1) What is measured using the voltmeter?

(a) Current in the circuit

(b) Voltage in the circuit

(c) The voltage across the resistor

(d) The resistance offered by the resistor

Q2) The least resistance obtained by using 2Ω, 4Ω, 1Ω and 100Ω is

(a) < 100 Ω

(b) < 4 Ω

(c) < 1 Ω

(d) > 2 Ω

Q3) Work of 14 J is done to move 2C charge between two points on a conducting wire. What is the potential difference between the two points?

(a) 28 V

(b) 14 V

(c) 7 V

(d) 3.5 V

Q4) A fuse wire repeatedly gets burnt when used with a good heater. It is advised to use a fuse wire of

(a) More length

(b) Less radius

(c) Less length

(d) More radius

Q5) A circuit has a charge of 2C moving through it in 3 s. Which electrical component in the circuit, if present, will show the current?

(a) Voltmeter will show a current of 6 A

(b) Ammeter will show a current of 0.7 A

(c) Rheostat will show a current of 0.7 A

(d) Resistor will show a current of 0.35 A

Q6) When a potential difference is applied across the two ends of the conductor, then an electric field due to applied potential difference exists

(a) outside the conductor

(b) inside the conductor

(c) both outside and inside the conductor

(d) no where

Q7) If two identical heaters, each rated as 1000 W – 220 V; are connected in parallel to 220 V, then the total power consumed is

(a) 200W (b)2500W (c) 250 W (d) 2000 W

Q8) Amount of charge flowing through a particular area in a unit time is called.

(a) electric charge

(b) electric potential

(c) electric current

(d) all of these

Q9) Which device is used to measure the potential difference between two points in an electric circuit?

a) Ammeter

b) Voltmeter

c) Galvanometer

d) Rheostat

Q 10) Which of the following is the resistance of a superconductor?

a) Zero

b) Infinite

c) 1 ohm

d) 10 ohm

Answer -

1.C

2.C

3.C

4.D

5.B

6.B

7.D

8.C

9.B

10.

CH11-SECTION B - ASSERTION AND REASON QUESTIONS (1 MAR

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

1.Assertion (A) : Tungsten metal is used for making filaments of incandescent lamps.

Reason (R) : The melting point of tungsten is very low.

Answer - (c)A is true but R is false.

2. Assertion (A) : If a graph is plotted between the potential difference and the current flowing,the graph is a straight line passing through the origin.

Reason (R) : The current is directly proportional to the potential difference.

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

3. Assertion (A) : Longer wires have greater resistance and the smaller wires have lesser resistance.

Reason (R) : Resistance is inversely proportional to the length of the wire.

Answer - (c)A is true but R is false.

4. Assertion (A) : Alloys are commonly used in electrical heating devices, like electrical iron, toasters etc.

Reason (R) : Alloys do not oxidise (burn) readily at high temperatures.

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

5. Assertion (A) : When the resistances are connected end-to-end consecutively, they are said tobe in series.
Reason (R) : In case the total resistance is to be increased, then the individual resistances are connected in series.
Answer - (b)Both A and R are true but R is not the correct explanation of A.

6. Assertion (A) : When the resistances are connected between the same two points, they are saidto be connected in parallel.
Reason (R) : In case the total resistance is to be decreased, then the individual resistances are connected in parallel.
Answer - (b)Both A and R are true but R is not the correct explanation of A.

7. Assertion (A) : A cell is a device which converts chemical energy into electrical energy.
Reason (R) : Cell maintains a constant potential difference between its terminals for a long time.
Answer - (b)Both A and R are true but R is not the correct explanation of A.

8. Assertion (A) : The resistivity of a substance does not depend on the nature of the substanceand temperature.
Reason (R) : The resistivity of a substance is a characteristic property of the material.
Answer - (d)A is false but R is true.

9. Assertion(A) : Tungsten metal is used for making filaments of incandescent lamps.
Reason (R): The melting point of tungsten is very low.
Answer – (c)A is true but R is false.

10. Assertion (A) : The fuse is placed in series with the device.
Reason (R) : Fuse consists of a piece of wire made of a metal or an alloy of appropriatemeltingpoint.
Answer – (b)Both A and R are true but R is not the correct explanation of A.

CH11-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

1.What is a ‘fuse' in a circuit? How is it connected in the domestic circuit?

ANS. A fuse is an electrical safety device, that is connected in series in a circuit to protect the electrical circuit and the devices in the circuit from the excess passage of current through it.

(2) List the factors on which the resistance of a conductor depends.

Or

Write the SI unit of resistance and resistivity.

ANS. (2) Resistance of a conductor depends upon the following factors:

(1) Length of the conductor.

(2) Area of cross section of the conductor.

(3) Nature of conductor.

(4) Temperature

Or

(ii) SI unit of resistance and resistivity are Ω and Ω m respectively.

CH11-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

Q1. Define the term “volt”?

Ans: If 1-joule of energy is transferred between two points A and BB, the potential difference between them is one volt. In an electric circuit, work is done to move one coulomb of charge from one point to another field.

Q2. Why does the connecting rod of an electric heater not glow while the heating element does?

Ans: As its resistance is lower than that of the heating element, the connecting cord of an electric heater does not glow. As a result, the heating element produces more heat than the connecting cord, and it glows

Q3. Alloys are used in electrical heating devices rather than pure metals. Give a reason.

Ans: Alloys are utilised in electricity heating devices rather than pure metals because alloys have a higher resistivity and hence produce more heat. Furthermore, alloy is non-combustible (or oxidises

easily at higher temperature).

Q4. On what factor does the resistance of a conductor depend?

Ans: The factors on which Resistance depends are:

(a) Length of the conductor

(b) Area of cross - section

(c) Temperature

(d) Nature of material

Q5. What does an electric circuit mean?

Ans: An electric circuit is a current route that is both continuous and closed. Current can flow through an electric circuit if it is complete.

CH11-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

Read the following and answer the questions

CASE BASE - 1

Electrical resistivities of some substances at 20°C are given in the table. Based on the info in the table, answer the given questions.

Silver	1.60 X 10-8 m
Copper	1.62 X 10-8 m
Tungsten	5.2 X 10-8 m
Mercury	94 X 10-8 m
Iron	10 X 10-8 m
Nichrome	100 10-8 m

1.Which is a better conductor of electric current ?

(A) Silver (B) Copper (C) Tungsten (D) Mercury

2.Which element will be used for electrical transmission lines ?

(A) Iron (B) Copper (C) Tungsten (D) mercury U

3.Nichrome is used in the heating elements of electric heating device because:

(A) It has high resistivity

(B) It does not oxidise readily at high temperature

(C) Both of the above

(D) None of the above U

4.Series arrangement is not used for domestic circuits because:

(A) Current drawn is less

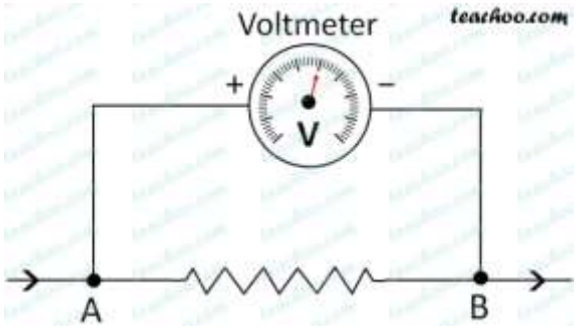
(B) Current drawn is more

(C) Neither of the above

(D) Both of the above

CASE BASE - 2

The electrical energy consumed by an electrical appliance is given by the product of its power rating and the time for which it is used. The SI unit of electrical energy is Joule (as shown in figure).Actually, Joule represents a very small quantity of energy and therefore it is inconvenient to use where a large quantity of energy is involved.



(i) The SI unit of electric energy per unit time is

(a) joule (b) joule-second (c) watt (d) watt-second

(ii) (ii) Kilowatt-hour is equal to

(a) 3.6×10^4 J (b) 3.6×10^6 J (c) 36×10^6 J (d) 36×10^4 J

(iii) The energy dissipated by the heater is E. When the time of operating the heater is doubled, the energy dissipated is

(a) doubled (b) half (c) remains same (d) four times

(iv) (iv) The power of a lamp is 60 W. The energy consumed in 1 minute is

(a) 360 J (b) 36 J (c) 3600 J (d) 3.6 J

CH11-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Q1. Explain the following:

(a) Why is tungsten used almost exclusively for filament of electric lamps?

Ans: For the filament of electric lamps, we need a robust metal with a high melting point. Because of its high melting point, tungsten is utilised only for electric lamp filament.

(b) Why are the conductors of electric heating devices, such as bread-toasters and electric irons, made of an alloy rather than a pure metal?

Ans: Electric heating device conductors are composed of an alloy because it has a higher resistance than pure metal and a higher melting point, which prevents it from oxidising at high temperatures.

(c) Why is the series arrangement not used for domestic circuits?

Ans: As the current to all appliances remains constant despite varying resistance, each appliance cannot be turned on or off independently.

(d) How does the resistance of wire vary with its area of cross-section?

Ans: As resistance of a wire is inversely proportional to its cross-section area, the resistance will decrease when the area of cross section increases.

(e) Why are copper and aluminum wires usually employed for electric transmission?

Ans: As copper and aluminium wires are good conductors with low resistance, they are commonly utilised for electrical transmission. They can also be drawn into thin wires since they are ductil

Q2. What are the advantages of connecting electrical devices in parallel with the battery instead of connecting them in series?

Ans: The following are the benefits of connecting electrical equipment in parallel with the battery rather than in series:

(i) Each connecting electrical device will have the same voltage, and the device will take current according to its resistance.

(ii) It is possible to use separate on/off switches.

(iii) As the total resistance in the parallel circuit falls, a large current can be pulled from the cell.

(iv) Even if one electrical gadget is broken, other devices continue to function normally.

Q3. What are insulators? Discuss some properties of insulators.

Ans. **Insulators** are considered to be materials within which free flow of electrons from one particle of the element to the other particle is interrupted. If a certain amount of charge is transferred to such an element at a given point of time, then the charge does not get distributed in the surface and remains at the same position. The most common process to charge these elements is by rubbing or charging it

through induction. Some examples of insulators are wood, plastic and glass. Let's discuss some properties of insulators:

There are no free electrons in such material because all the electrons are tightly held with each other.

The ability of these materials to stop the electric current from passing through them is known as resistance.

Dielectric length of insulators is vast. Dielectric strength is considered as the maximum electric field that an insulator can handle without suffering an electrical breakdown.

High air permeability is a feature of good insulators as they allow air to pass through their pores.

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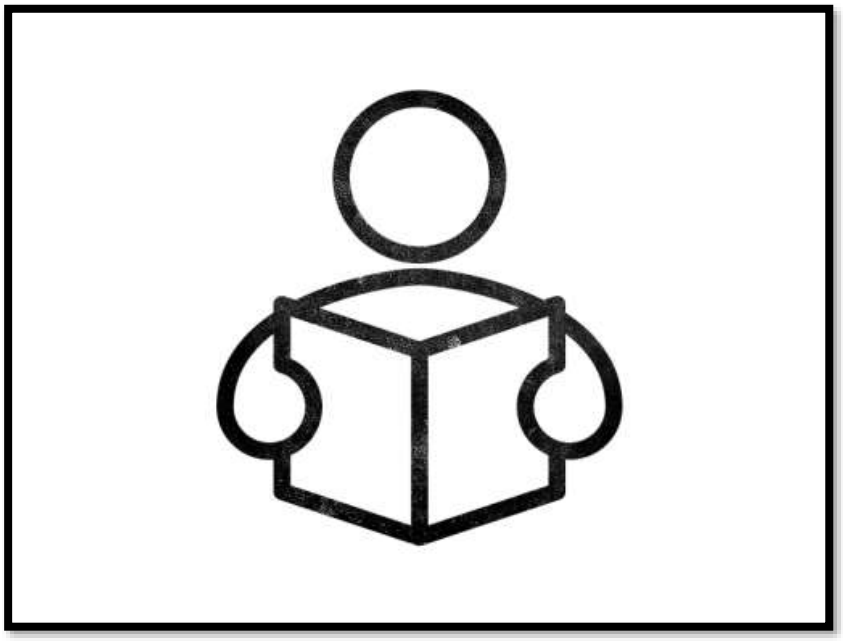


CHAPTER 12 - MAGNETIC EFFECTS OF ELECTRIC CURRENT

CH12-SECTION A - MCQ (1 MARKS)

Q11) The most suitable material for making the core of an electromagnet is:

a) Steel

b) Iron

c) Soft iron

d) Aluminium

Q12) Which of the following is not attracted by a magnet?

(a) Steel

(b) Cobalt

(c) Brass

(d) Nickel

Q13) When a straight conductor is carrying current:

a) There are circular magnetic field lines around it

b) There are magnetic field lines parallel to the conductor

c) There are no magnetic field lines

d) None of the above

Q14) A plotting compass is placed near the south pole of a bar magnet. The pointer of the plotting compass will:

(a) Point away from the south pole

(b) Point parallel to the south pole

(c) Point towards the south pole

(d) Point at right angles to the south pole

Q15) Two magnetic field lines:

a) Intersect at the neutral point

b) Never intersect each other

c) Intersect near north-pole or south pole

d) Intersect at the midpoint of the magnet

Q 16) **What is electromagnetic induction?**

a. the process of charging a body

b. The process of rotating a coil of an electric motor

c. producing induced current in a coil due to relative motion between a magnet and the coil

d. The process of generating magnetic field due to a current passing through a coil.

Q 17). What happens to the current in short circuit?

a. reduces substantially

b. .does not change

c. increases heavily

d. vary continuously

Q 18). An alpha particle is diverted towards west is deflected towards north by a field. The field is magnetic. What will be the direction of field?

a. Towards south

b. towards east

c. downward

d. upward

Q 19) **Who has started the right hand thumb rule?**

a. Maxwell

b. Newton

c. Fleming

d. Einstein

Q20) For a current in the long straight solenoid, N and S-poles are created at the two ends. Among the following statement, the incorrect statement is:

a) The field lines inside the solenoid are in the form of straight lines, which indicates that the magnetic field is the same at all points inside the solenoid

b) The strong magnetic field produced inside the solenoid can be used to magnetise a piece of a magnetic material like soft iron when placed inside the coil

c) The pattern of the magnetic field associated with the solenoid is different from the pattern of the magnetic field around a bar magnet.

d) The N and S-poles exchange position when the direction of the current through the solenoid is reversed

11.C

12.A

13.A

14.C

15.B

16.C

17.C

18.D

19.A

20.A

CH12-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS)

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

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

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

(c) A is true but R is false.

(d) A is false but R is true.

1.Assertion(A): On changing the direction of flow of current through a straight conductor, the direction of a magnetic field around the conductor is reversed.

Reason (R) : The direction of magnetic field around a conductor can be given in accordance with left hand thumb rule.

Answer - (c)A is true but R is false.

2. **Assertion(A):** The strength of an electromagnet can be increased by increasing the number of turns per unit length in a solenoid coil.

Reason (R): The strength of an electromagnet can be increased by increasing the current flowing through the solenoid.

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

3.**Assertion(A):** On changing the direction of the flow of current through a straight conductor, the direction of a magnetic field around the conductor is reversed.

Reason (R): The direction of the magnetic field around a conductor can be given in accordance with

the left-hand thumb rule.
Answer - (c) A is true but R is false.

4.**Assertion(A) :** A current carrying wire deflects a magnetic needle placed near it.
Reason (R) : A magnetic field exists around a current carrying wire.
Answer - (a) Both A and R are true and R is the correct explanation of A.

5.**Assertion(A) :** The strength of the magnetic field at the centre of a circular coil of a wire depends on the radius of the coil
Reason (R) : The strength of the magnetic field at the centre of a circular coil of a wire depends on the number of turns of the wire in the coil.
Answer - (b) Both A and R are true but R is not the correct explanation of A.

6.**Assertion(A) :** Alternating Current is used in household supply.
Reason (R) : AC electric power can be transmitted over long distances without much loss of energy.
Answer - (a) Both A and R are true and R is the correct explanation of A.

7.**Assertion(A) :** The strength of the magnetic field produced at the centre of a current carrying circular coil increases on increasing the radius of the circular coil.
Reason (R) : Magnetic field strength is inversely proportional to the radius of the circular coil.
Answer - (d) Assertion is false but reason is true

8.**Assertion(A) :** On freely suspending a current-carrying solenoid, it comes to rest in N-S direction just like a bar magnet.
Reason (R) : One end of current carrying straight solenoid behaves as a North pole and the other end as a South pole.
Answer - (a) Both A and R are true and R is the correct explanation of A.

9.**Assertion(A) :** A compass needle is placed near a current carrying wire. The deflection of the compass needle decreases when the compass needle is displaced away from the wire.
Reason (R) : Strength of a magnetic field decreases as one moves away from a current carrying conductor.
Answer - (a) Both A and R are true and R is the correct explanation of A.

10.**Assertion (A):** A solenoid is a long coil of wire with numerous closely spaced turns.

Reason (R): The magnetic field inside a solenoid is strong and uniform.

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

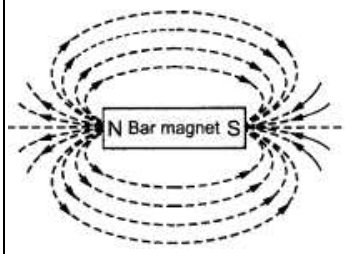
CH12-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

Q.1 Why does a compass needle get deflected when brought near a bar magnet ?

Answer: The magnetic field of the magnet exerts force on both the poles of the compass needle. The forces experienced by the two poles are equal and opposite. These two forces form a couple which deflects the compass needle.

Q.2 Draw magnetic field lines around a bar magnet.

Answer:



Q.3 List the properties of magnetic lines of force.

Answer: Properties of magnetic lines of force :

The magnetic field lines originate from the north pole of a magnet and end at its south pole.

The magnetic field lines become closer to each other near the poles of a magnet but they are widely separated at other places.

Q.4 Name some sources of direct current.

Answer: Some of the sources of direct current are dry cells, button cells, lead accumulators

Q.5 Which sources produce alternating current ?

Answer: Alternating current is produced by AC generators of nuclear power plants, thermal power plants, hydroelectric power stations, etc.

CH12-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

Q1. How does the strength of the magnetic field at the centre of a circular coil of a wire depend on the radius of the coil and the number of turns of the wire of the coil?

Ans. The strength of magnetic field at the centre of the circular coil is:

(a) Inversely proportional to the radius of the coil.

(b) Directly proportional to the number of turns of the wire of the coil.

Q2. What are magnetic field lines? List three characteristics of these lines.

Ans. Magnetic field lines: These are the imaginary close curves which are used to represent the magnetic field around the magnet.

The properties of the magnetic field lines are listed below:

Magnetic field lines start at the north pole and end at the south pole.

Magnetic field lines do not intersect each other, because there can't be two directions of the magnetic field at any one point.

The degree of closeness of the field lines depends upon the strength of the magnetic field. Stronger the field, closer are the field lines.

Q3. What is overloading? How can you avoid overloading?

Ans. Overloading means large amount of current flows in the circuit. It can happen when many electrical appliances of high-power ratings are connected in a single socket. It can be avoided by the following methods:

(i) Not use too many appliances in a single socket

(ii)To apply preventive methods of short circuiting.

Q4. Why does a current carrying conductor kept in a magnetic field experience force? What is the direction of force acting on the conductor?

Ans. A current carrying coil contains charged particles which experiences a force (Bqv). The total force experienced by the charged particle is equal to the force experienced by the conductor which is perpendicular to both the magnetic field and the direction of current in the conductor.

Q5. Distinguish between A.C and D.C?

Ans.

	Alternating current		Direct current
(1)	The magnitude of current is constant and flows in one direction only.	(1)	The magnitude and direction of current reverses periodically.
(2)	The frequency of direct current is zero.	(2)	The frequency of alternating Current is finite.
(3)	Direct current cannot be used for households purposes.	(3)	It is used to run electrical appliances like bulb, heater, iron etc.

CH12-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

CASE BASE - 1

The region around a magnet where magnetism acts is represented by the magnetic field.The force of magnetism is due to moving charge or some magnetic material. Like stationary charges produce an electric field proportional to the magnitude of charge, moving charges produce magnetic fields proportional to the current. In other words, a current carrying conductor produces a magnetic field around it. The subatomic particles in the conductor, like the electrons moving in atomic orbitals, are responsible for the production of magnetic fields. The magnetic field lines around a straight conductor (straight wire) carrying current are concentric circles whose centres lie on the wire.

1) The magnetic field associated with a current carrying straight conductor is in anti- clockwise direction. If the conductor was held horizontally along east west direction,what is the direction of current through it?

2) Name and state the rule applied to determine the direction of magnetic field in a straight current carrying conductor.

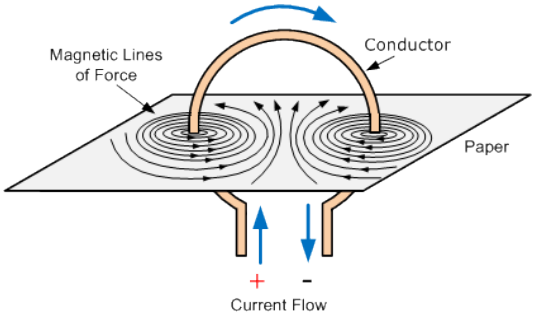
3) Ramus performs an experiment to study the magnetic effect of current around a current carrying straight conductor with the help of a magnetic compass. He reports that

a) The degree of deflection of magnetic compass increases when the compass is moved away from the conductor.

b) The degree of deflection of the magnetic compass increases when the current through the conductor is increased.

Which of the above observations of the student appears to be wrong and why?

CASE BASE - 2



When a current is passed through the circular loop of wire, a magnetic field lines near the coil are nearly circular and concentric. At the centre of the circular loop, the magnetic field lines are straight. The strength of the magnetic field produced by a current-carrying circular coil (or circular wire) depends on (i) current flowing through the coil. (ii) radius of the circular coil. (iii) number of turns of wire in the circular coil. The direction of the field lines can be found by applying right-hand thumb rule.

(i) A long horizontal power line is carrying a current of 100 A in the east-west direction. What is the direction of magnetic field at a point 1.0 m below it?

(a) North-South (b) East-West (c) South-East (d) North-West

(ii) State the pattern of magnetic field lines for current carrying circular conductor.

(a) Magnetic field lines will be concentric circles to any point of the circular loop

(b) At centre, the field lines appear straight

(c) Both of these

(d) None of these

(iii) If a current carrying straight conductor is placed in east-west direction, then find the direction of the force experienced by the conductor due to earth's magnetic field.

(a) Upward (b) Downward (c) Can't determined (d) Same as of current

(iv) According to right-hand thumb rule direction of the curl of fingers of the right hand gives the

(a) electric field lines

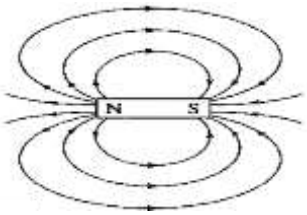
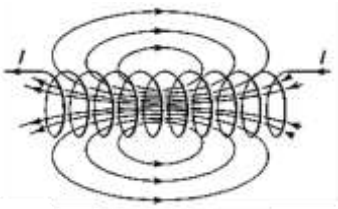
(b) magnetic field lines

(c) direction of magnetic field

(d) direction of current

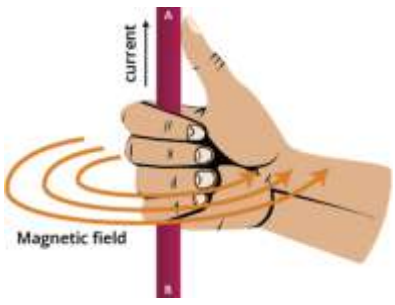
CH12-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Differences between a bar magnet and solenoid:

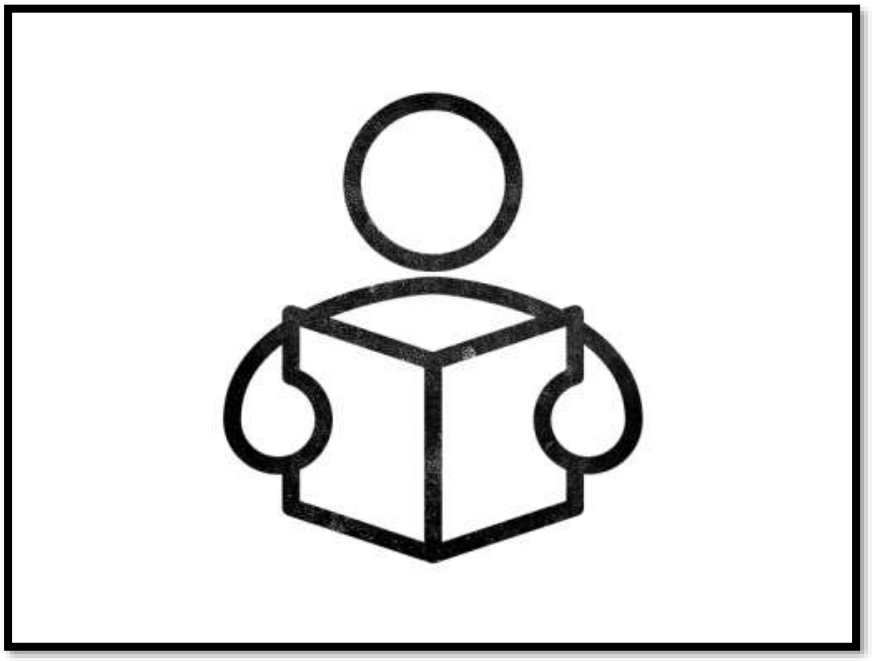
Bar magnet	**Solenoid**
1. It is a permanent magnet.	1. It is a temporary magnet. It acts as a magnet only as long as the current passes through it.
2. The strength of a bar magnet cannot be changed.	2. The strength of a solenoid can be changed by changing the number of turns in its coil or by changing the current passing through it.
3. The polarity (North – South) of a bar magnet cannot be changed.	3. The polarity of a solenoid can be changed by changing the direction of current in its coil.
4. 	4. 

Q3. **How will you find out the direction of the magnetic field produced by current-carrying conductor?**

Ans. The direction of lines of force of the magnetic field produced by a straight wire carrying current is obtained by Maxwell's right-hand thumb rule. According to Maxwell's right-hand thumb rule, "Imagine that the current carrying wire is in the right hand so that the thumb points in the direction of current, then the direction in which the fingers encircle the wire gives the direction of magnetic lines of force around the wire.



Imagine a current carrying wire AB in which the current is flows vertically upwards. To find out the direction of magnetic lines of force produced by this current, we imagine the wire AB to be held in the right hand, so that the thumb points in the direction of current towards A. Now, the direction in which the fingers are folded gives the direction of the lines of force. In this case the fingers are folded in the anti-clockwise direction, so the magnetic lines of force are also in the anti-clockwise direction.



CHAPTER 13 - OUR ENVIRONMENT

CH13-SECTION A - MCQ (1 MARKS)

Q21) The decomposers in an ecosystem:

a) Convert organic material to inorganic forms

b) Convert inorganic material to simpler forms

c) Convert inorganic material into the organic compound

d) Do not break down the organic compound

Q22) Some waste products are listed below:

- **Grass Cutting**
- **Polythene Bag**
- **Plastic Toys**
- **Used Tea Bags**
- **Old Clothes**
- **Paper Straw**

Which group of waste materials can be classified as non-biodegradable?

a) Plant waste, used tea bags

b) Polyethene bags, plastic toys

c) Used tea bags, paper straw

d) Old clothes, broken footwear

Q23) Which statement shows the interaction of an abiotic component with a biotic component in an ecosystem?

a) A grasshopper feeding on a leaf

b) Rainwater running down into the lake

c) An earthworm making a burrow in the soil

d) A mouse fighting with another mouse for food

Q24) Which of the following are environment-friendly practices?

a) Carrying a cloth bag to put purchases while shopping.

b) Switching off unnecessary lights and fans

c) Walking to school instead of getting your mother to drop you on her scooter

d) All of the above

Q25) The amount of energy that flows from one trophic level to another in a food chain is

a) 5%

b) 10 %

c) 20 %

d) 15 %

Q26) The manufacturing of Chlorofluorocarbons free refrigerators is mandatory throughout the world. How does this help prevent ozone depletion?

a) This will help convert oxygen molecules into ozone

b) This will help convert the CFCs into ozone molecules

c) This will reduce the production of CFCs from oxygen molecules

d) This will reduce the release of CFCs that reacts with ozone molecules

Q27) The primary consumers are

a) Carnivores

b) Herbivores

c) Omnivores

d) Producers

Q28) Which of the following is responsible for the depletion of the ozone layer

a) CFCs

b) Oxygen

c) SO_2

d) CO_2

Q29) Ozone forms by the combination of free oxygen atoms and oxygen molecules. How do free oxygen atoms form at higher levels of the atmosphere?

a) By splitting molecular oxygen into free oxygen atoms in the presence of low-energy UV radiations

b) By splitting molecular oxygen into free oxygen atoms in the presence of high-energy UV radiations

c) By the combination of two molecular oxygen in the presence of high energy UV radiations

d) By the combination of two free oxygen atoms in the presence of lower energy UV radiations

Q30) The driving force of any ecosystem is

a) Carbohydrates

b) Solar energy

c) Biomass

d) ATP

Answers

21.A
22.B
23.C
24.D
25.B
26.D
27.B
28.A
29.B
30.B

CH13-SECTION B - ASSERTION AND REASON QUESTIONS (1 MARKS)

Following questions consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

1.Assertion(A): Ozone layer is getting depleted at upper atmosphere and it is a serious cause of concern.
Reason(R): CFC reacts with ozone and breaks it.
Answer - (a) both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

2.Assertion(A): Biodegradable substances result in the formation of compost and natural replenishment.
Reason(R): It is due to breakdown of complex inorganic substances into simple organic substances
Answer -(c) A is true but R is false.

3.Assertion(A): Polythene bags and plastic containers are non-biodegradable substances.
Reason(R): They can be broken down by microorganisms in natural simple harmless substances.
Answer - (c) ‘A’ is true but ‘R’ is false.

4.Assertion(A): The concentration of harmful chemicals is least in human beings.
Reason(R): Man is at the apex of the food chain.
Answer - (d) ‘A’ is false but ‘R’ is true.

5.Assertion(A): Ozone is formed in upper atmosphere by O2 in presence of UV radiations.
Reason(R): Ozone depletion will lead to UV rays reaching earth which may cause skin cancer.
Answer - (b) Both ‘A’ and ‘R’ are true but ‘R’ is not correct explanation of the assertion.

6. Assertion(A): Aquarium needs regular cleaning
Reason(R): There are no microbes to clean water in aquarium, therefore, it needs to be regularly cleaned.
Answer - (a) Both ‘A’ and ‘R’ are true and ‘R’ is correct explanation of the assertion.

7.Assertion(A): Accumulation of harmful chemicals is higher in case of organisms at higher trophic level.
Reason(R): Food chain normally can’t reduce beyond 3 or 4 trophic level.
Answer - (b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.

8.Assertion(A): Vegetarian food habit is more beneficial to organisms.
Reason(R): Only 10% energy is available as food from one trophic level to next.
Answer - (a) Both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

9.Assertion(A): Autotrophs can produce food on its own.
Reason(R): Green plants can absorb 1% energy of sunlight that fall on the leaves.
Answer - (b) The Assertion and the Reason are correct but the Reason is not the correct explanation of the Assertion.

10.Assertion(A): Ozone layer is getting depleted at upper atmosphere and it is a serious cause of concern.

Reason(R): CFC reacts with ozone and breaks it.

Answer - (a) both the Assertion and the Reason are correct and the Reason is the correct explanation of the Assertion.

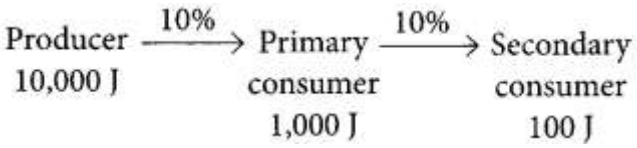
CH13-SECTION C1- SHORT ANSWER QUESTIONS (2 MARKS)

Why is the maximum concentration of pesticides found in human beings? Also, name the phenomenon.

ANS. The pesticides are not biodegradable, they get accumulated progressively at each trophic level. As human beings occupy the topmost level in food chain, their concentration becomes maximum in our bodies. Phenomenon is biological magnification.

In a food chain, if 10,000 joules of energy is available to the producer, how much energy will be available to the secondary consumer to transfer it to the tertiary consumer?

ANS. According to ten percent law, 10% of the energy of producer will be available to primary consumer, and 10% of this energy will be available to secondary consumer and so on.



Hence, 100 J of energy will be available to the secondary consumer to transfer it to tertiary consumer.

CH13-SECTION C2 - SHORT ANSWER QUESTIONS (3 MARKS)

Q1. How is ozone formed in the upper atmosphere? Why is the damage of ozone layer a cause of concern to us? State a cause of this concern?

Ans: Ozone is formed in the stratosphere naturally by solar ultraviolet radiations(uv) and oxygen molecules. Firstly, the solar radiation breaks up one oxygen molecule into two Oxygen atoms-

O_2 ---------->O + O

Then the highly reactive oxygen atoms react with another oxygen molecule to give ozone.

$O_2 + O$ ----------> O_3

Q2. What is an ecosystem? Mention its components?

Ans. An ecosystem is a group of community composed of living and non living thigs and their interaction with each other. Every ecosystem has two components, biotic and abiotic components.

Q3. Draw a line diagram to show flow of solar energy in ecosystem.

Q4. Explain 'biological magnification' with the help of an example.

Ans: Biomagnification is defined as the accumulation of a particular substance in the body of the organisms at different trophic levels of a food chain. One example of biomagnification

The accumulation of insecticide DDT which gets accumulated in zooplanktons and small fishes consume these zooplanktons.

Q5. What are Biotic and Abiotic components of environment?

Ans. Biotic components: That come from organisms like plants and animal products including them.

Abiotic components: Other than organisms like soil, air sun light etc.

CH13-SECTION D - CASE STUDY BASED QUESTIONS (4 MARKS)

Read the following and answer the questions

CASE BASE - 1

Food chains are very important for the survival of most species. When only one element is removed from the food chain it can result in extinction of a species in some cases. The foundation of the food chain consists of primary producers. Primary producers, or autotrophs, can use either solar energy or chemical energy to create complex organic compounds, whereas species at higher trophic levels cannot and so must consume producers or other life that itself consumes producers. Because the sun's light is necessary for photosynthesis, most life could not exist if the sun disappeared. Even so, it has recently been discovered that there are some forms of life, chemotrophs, that appear to gain all their metabolic energy from chemosythesis driven by hydrothermal vents, thus showing that some life may not require solar energy to thrive.

1 If 10,000 J solar energy falls on green plants in a terrestrial ecosystem, what percentage of solar

energy will be converted into food energy?

a) 10,000 J

b) 100 J

c) 1000 J

d) It will depend on the type of the terrestrial plant.

2 Mr. X is eating curd/yogurt. For this food intake in a food chain he should be considered as occupying

a) First trophic level

b) Second trophic level

c) Third trophic level

d) Fourth trophic level 13

3 The decomposers are not included in the food chain. The correct reason for the same is because decomposers:

a) Act at every trophic level of the food chain b)

Do not breakdown organic compounds

c) Convert organic material to inorganic forms

d) Release enzymes outside their body to convert organic material to inorganic forms

4 Matter and energy are two fundamental inputs of an ecosystem. Movement of

a) Energy is bidirectional and matter is repeatedly circulating.

b) Energy is repeatedly circulation and matter is unidirectional.

c) Energy is unidirectional and matter is repeatedly circulating.

d) Energy is multidirectional and matter is bidirectional.

Answer Key 1 b) 100 J

2 c) Third Trophic level

3 a) Act at every trophic level of the food chain

4 c) Energy is unidirectional and matter is repeatedly circulating

CASE BASE - 2

In Kunjpura village, located in Karnal district, Haryana, Aditya Aggarwal and his older brother Amit

Aggarwal run Tee Cee Industries, a steel plant set up by their ancestors in 1984. Along with this, they also run a gaushala that houses 1,200 cows that can no longer produce milk. The cow shelter was manageable but running the steel plant was turning out to be expensive becauthey spent a whopping Rs 5 lakh every month on electricity. The brothers struck upon an idea. Why not run the factory with the biogas produced from cow dung from the shelter and other gaushalas, along with bio and agri led Aditya and Amit to start AmritFertilisers, a biogas project, in 2014, without any government support. 11 The cow shelter was manageable but running the steel plant was turning out to be expensive becauthey spent a whopping Rs 5 lakh every month on electricity. The brothers struck upon an idea. Why not run the factory with the biogas produced from cow dung from the shelter and other gaushalas, along with bio and agri-waste like sewage, farm waste, etcled Aditya and Amit to start AmritFertilisers, a biogas project, in 2014, without any government support.

1 Biogas is a mixture of the following gases.

(a) Ethane,Carbon monoxide, Nitrogen and Butane

(b) Methane,Hydrogen,Carbon dioxide and Nitrogen

(c) Butane,Carbon monoxide,Propane and Hydrogen

(d) Carbon monoxide,Sulphur dioxide and Hydrogen

2 Raw material used in bio gas plant is

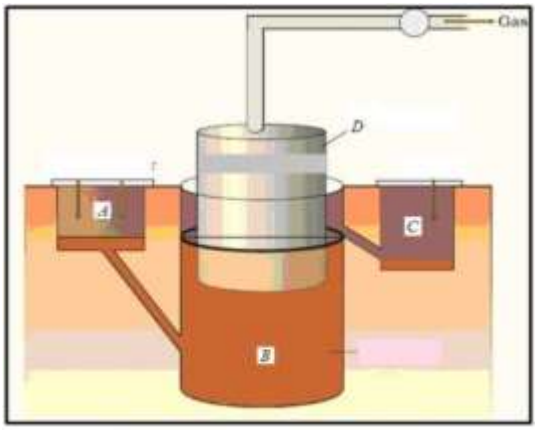
(a) Animal dung

(b) crop residue

(c) Food waste

(d) All of the above

3 The correct labelling in a biogas plant is given in



(a) A- Manure B-

(b)A- Slurry B-Digester

(c) A-Gas tank B-Manure

(d) A- Digester B-Gas tank

4 Biogas is a better fuel than animal dung cake because

(i) Biogas has lower calorific value.

(ii) Animal dung cake has higher calorific value.

(iii) Biogas has high heating capacity.

(iv) Biogas burns without smoke.

(a) (i) only

(b) (ii) only

(c) (iii) and (iv)

(d) (i) and (ii)

CH13-SECTION E - LONG ANSWER TYPE QUESTION (5 MARKS)

Q1.(A) What is environmental pollution? (2M)

(B) Distinguish between biodegradable and non-biodegradable pollutants. (any two 2M)

(C) Choose the non-biodegradable pollutants from the list given bellow: (1M)

Paper, DDT, radioactive waste, plastic, insecticides.

Ans. (A) Environmental pollution is an undesirable change in the physical, chemical or biological characteristics of the natural environment.

(B) The following are the differences:

Biodegradable:

1. Substance that breaks up naturally.
2. Materials like plants, animals, their wastes fall under this category.
3. The biodegradable Waste occurs from natural products such as kitchen waste, paper etc
4. The rate of decomposition of biodegradable waste is fast.
5. Microorganisms have capability to decompose them.

Nonbiodegradable:

1. Substances that do not degrade easily.
2. Material such as rubber, plastics, chemicals etc fall under this category.
3. These materials do not occur naturally.
4. The rate of decomposition of biodegradable waste is slow.
5. Microorganisms do not have capability to decompose them.

(C) DDT, radioactive waste, plastic and insecticides.

Q2. (A) What are consumers? What will be the consequence of the absence of primary consumers in

an ecosystem?

(B) What will be the energy direction of energy transfer in each of the following case:

i) Grasshopper eaten by frog.

ii) Deer feeds on grass.

iii) Deer eaten by a lion.

Ans. (A) Consumers are the ones who cannot produce their own food. They depend on producers for food and energy. They constitute the upper in an ecosystem. Examples- human Beings and other animals. They depend on plants for food and energy.

(B) (i) When frog eats grasshopper it becomes the secondary consumer so the energy transfer will be from primary consumer (grasshopper) to frog.

(ii) Producer to primary consumer.

(iii) Secondary consumer to tertiary consumer.

Q3. (A) What are decomposers? What will be the consequence of their absence in an ecosystem?

(B) Name the waste which are generated in your house daily? What measure will you take for their disposal?

Ans. (A) Decomposers are the microorganisms that digest the things that are dead or decaying and turn the dead plants and animals into humus. In the absence of decomposers Recycling of the materials in biosphere will not take place which would lead to the accumulation of dead plants and animals in the environment.

(B) Waste produced at home:

Vegetables and fruits peel, paper, news paper, plastic, magazines, sanitary napkins, clothes, books etc.

Measures to be taken for waste disposal:

Vegetable and fruit peels can be used to prepare manure.

Paper, plastic, newspaper can be recycled.

Sanitary pads napkins can be wrapped in newspaper before disposing it.

Old book and clothes can be donated to the person in need.