Question bank

Chapter-1 Chemical industries

Q-1 **1. Where are the major oil refineries located?**

Q-2 **2. Why is it so important to any developing country to have an iron and steel industry?**

Q-3 **3. Why does Nigeria need a chemical industry?**

Q-4 **4. Give six examples of commodity chemicals.**

Q-5 **5. Name four fields in which chemists developed products that are of benefit to you.**

Q-6 **6. Explain how the chemical industry is of benefit to its workers.**

Q-7 **7. It is difficult and expensive to dispose of waste materials.**

a) Why should we dispose of waste materials in the correct places?

b) How can we reduce the amount of waste?

c) What materials can be recycled?

Q-8 **8. Name all the benefits of recycling.**

Q-9 **9. Explain how the problems caused by the chemical industries can be minimised.**

Q-10 **Answer the following questions.**

(1) Where are the major oil refineries located?

(2) Why is it so important to any developing country to have an iron and steel industry?

(3) Why does Nigeria need a chemical industry?

(4) Give six examples of commodity chemicals.

(5) Name four fields in which chemists developed products that are of benefit to you.

(6) Explain how the chemical industry is of benefit to its workers.

(7) Name all the benefits of recycling.

(8) Explain how the problems caused by the chemical industries can be minimised.

Q-11 **It is difficult and expensive to dispose of waste materials. Explain the below :**

a) Why should we dispose of waste materials in the correct places?

b) How can we reduce the amount of waste?

c) What materials can be recycled?

Chapter-2 Introduction to chemistry

Q-1 **Answer the following question.**

(1) The following steps in an experiment are scrambled. Place them in the correct order: results, apparatus, aim, conclusion, method

(2) List the steps of the scientific method in the correct order.

(3) Define chemistry.

(4) Name four careers that are linked to chemistry.

Q-2 **State the applications of chemistry in each of the following:**

a) Military

a) Military

b) Chemical and/or petrochemical industries

c) Agriculture

d) Space science

Q-3 **Give a brief description of what is meant by:**

a) Design an experiment

b) Verify results

c) Draw a conclusion

Chapter-3 The particulate nature of matter

Q-1 **Classify each of the following as a physical or chemical change.**

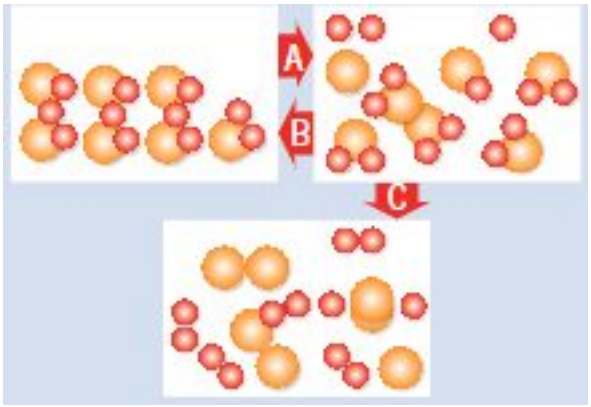
(a) Milk goes sour.

(b) A piece of an apple rots on the ground.

(c) Water is absorbed by a paper towel.

(d) A plant undergoes photosynthesis in the presence of sunlight and turns CO_2 and water into sugar and oxygen.

Q-2 **Study the diagram below and answer the questions that follow:**



(a) What is process A called?

(b) Is process B showing a physical or chemical change? Give a reason for your answer.

(c) Is energy absorbed or released during process B?

(d) Is process C showing a physical or chemical change? Give a reason for your answer.

Q-3 **Answer the following question :**

(1) Draw one atom of beryllium, which has 4 electrons, 4 protons and 5 neutrons. Label all the sub-atomic particles and show their charges.

(2) State Dalton's Atomic Theory.

(3) Complete the table for a sodium atom.

(4) Redraw and complete the following table.

Particle	Relative mass	Relative charge
11 protons	11 units	a)
12 neutrons	b)	c)
d)	0 units	−11

No	Name	Mass number	Atomic number	Nucleons	Protons	Neutrons	Electrons
1	Magnesium			24			12
2	Oxygen	16	8				
3	Sodium	23			11		
4	Sulphur		16	32			
5	Potassium	39	19				

Q-4 **The figure below shows a neon atom. The atomic number of neon is 10.**

(a) How many electron shells does this atom have?

(b) How many electrons are there in the first shell?

(c) How many electrons are there in the second shell?

(d) Can these shells accommodate any more electrons?

Q-5 **Carbon's relative atomic mass is 12. The relative atomic mass of magnesium is double that of carbon and the relative atomic mass of hydrogen is 1/12 that of carbon.**

(a) Define relative atomic mass.

(b) Write down the relative atomic mass of magnesium and hydrogen.

Multiple Choice Questions

Q-1 **Which is not a sub-atomic particle?**

(a) Proton

(b) Neutron

(c) Photon

(d) Electron

Q-2 **The particles responsible for the mass of an atom are the:**

(a) protons and neutrons

(b) protons and electrons

(c) protons, neutrons and electrons

(d) protons, neutrons and photons

Q-3 **The scientist that stated atoms of different elements are different is:**

(a) Democritus

(b) J Dalton

(c) Leucippus

(d) E E Rutherford

Q-4 **An electron has:**

(a) a positive charge

(b) a negative charge

(c) a neutral charge

(d) no charge

Q-5 **The three isotopes of hydrogen:**

(a) have the same mass number

(b) differ with respect to their number of electrons

(c) have the same atomic number

(d) have different numbers of protons in the nucleus

Chapter-4 Symbols, formulae and equations

Q-1 **Redraw the table in your exercise book and complete it.**

Symbol	Name
Fe	
	Sodium
K	
	Copper
B	
	Helium
Zn	
	Fluorine
Ba	
	Lithium
P	
	Sulphur
Ar	
	Carbon
N	
	Silicon
Ag	
	Chlorine
Ne	
	Hydrogen
Ca	
	Aluminium
O	
	Beryllium
Mg	
	Gold
Br	

Q-2 **Give one term or symbol for each of the following statements:**

(a) A change that involves the transformation of one or more substances into new substances

(b) The symbolic representation of a chemical reaction

(c) The symbol we use to show 'yield' or 'react to form'

(d) The symbol that we use to show that a compound is in the solid state

Q-3 **Write balanced equations for these reactions:**

(a) $H_2 O_2 \rightarrow H_2O + O_2$

(b) $SO_2 + O_2 \rightarrow SO_3$

(c) $Al + O_2 \rightarrow Al_2 O_3$

(d) $KClO_3 \rightarrow KCl + O_2$

(e) $H_2S + O_2 \rightarrow H_2O + SO_2$

(f) $CH_4 + O_2 \rightarrow CO_2 + H_2O$

(g) $MnO_2 + HCl \rightarrow MnCl_2 + H_2O + Cl_2$

(h) $Fe + H_2O \rightarrow Fe_3 O_4 + H_2$

Q-4 **Sodium hydrogen carbonate ($NaHCO_3$) reacts with sulphuric acid (H_2SO_4). The equation for the reaction is:**

$2NaHCO_3 (aq) + H_2SO_4 (aq) \rightarrow Na_2 SO_4 (aq) + CO_2 (g) + 2H_2 O(l)$

(a) State the Law of Conservation of Matter.

(b) This reaction is taking place in an open beaker. Is it possible to verify the Law of Conservation of Matter by measuring the mass before and after the reaction? Explain your answer.

(c) Verify the Law of Conservation of Matter by counting the number of atoms before and after the reaction.

Q-5 **Say whether each statement below is correct or incorrect. If it is incorrect, say why.**

(a) The Law of Conservation of Mass operates 99% of the time.

(b) The mass of the reactants before a reaction and the mass of the products after that reaction will always balance.

(c) When more reactants are involved in the reaction, the Law of Conservation of Mass is less likely to operate.

(d) In an experiment, we treat 10 g of calcium carbonate with 5 g of acid to produce carbon dioxide. Some of the gas escapes into the air. At the end of the reaction, we weigh the product and find 12.3 g is missing. This proves that conservation of mass is invalid.

(e) The Law of Conservation of Mass applies to solids and liquids, but not to gases.

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Q-6 **The fixed ratio for H2O is 2:1. What are the fixed ratios of the atoms in the following compounds?**

(a) PbBr2

(b) NO2

(c) Al2O3

(d) Li2O

(e) CH4

(f) MgCl2

Q-7 **Copy and fill in the table. The first row has been done as an example.**

	Compound name	Number of atoms (in one molecule)	Atomic symbol	Compound formula
a)	Carbon dioxide	1 carbon 2 oxygen	C O	CO_2
b)	Water	2 hydrogen 1 oxygen		
c)	Sulphur trioxide	1 sulphur 3 oxygen		
d)	Oxygen	2 oxygen		
e)	Nitrogen dioxide	1 nitrogen 2 oxygen		
f)	Carbon monoxide	1 carbon 1 oxygen		
g)	Hydrogen fluoride	1 hydrogen 1 fluorine		
h)	Methane (carbon tetrahydride)	1 carbon 4 hydrogen		

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g)	Hydrogen fluoride	1 hydrogen 1 fluorine		
h)	Methane (carbon tetrahydride)	1 carbon 4 hydrogen		

Chapter-5 Chemical combination

Q-1 **Copy the blank Periodic Table in your book and fill in**

(a) the first 20 elements and their atomic numbers

(b) the group numbers.

Q-2 **This question is about the Periodic Table of elements. The letters shown in the table are not the symbols of the elements. Use only the letters given in the table where necessary to answer the questions.**

(a) How many protons are there in an atom of element K?

(b) Name the element that forms ions with a single negative charge.

(c) Name the element that has its electrons arranged in four energy levels.

(d) How many electrons are there in an atom of element J?

(e) Name the element that has the lightest atoms.

(f) Give the elements of Group 1.

(g) Name the element that has three valence electrons.

(h) Give the group number to which element K and L belong.

(i) State why the electron configuration of K and L are important.

Q-3 **35X17 is an unknown element.**

(a) Draw an electron shell diagram of element X.

(b) Give the electron configuration of element X.

(c) List the number of protons, neutrons and electrons in a neutral atom of X.

(d) Name the element.

Q-4 **Answer the following question.**

(1) Give the main differences between the properties of covalently bonded substances and ionic substances.

(2) State the kinetic theory of matter.

(3) Explain in your own words what happens when water molecules change phase from a solid to a liquid state.

Q-5 **Use Lewis diagrams to show how the following molecules are formed from atoms:**

(a) Cl_2

(b) CS_2

Q-6 **Ammonia can form a coordinate covalent bond with a hydrogen ion to form NH_4^+**

(a) Give the Lewis diagram for the NH_3 molecule.

(b) Refer to the Lewis structure of NH_3 and state why it can form a coordinate covalent bond with the H^+ ion.

(c) Draw Lewis diagrams to show the reaction between NH_3 and a H^+ ion.

Q-7 **Name the type of intermolecular forces that exist between molecules/basic units in each of the following substances:**

(a) MgO

(b) NaCl

(c) H_2O and H_2O

(d) HF and HF

(e) C and C

Q-8 **Give the conventional names of the following compounds:**

(a) $MgCO_3$

(b) NaCl

(c) NH_4Br

(d) $MgSO_4$

Give the IUPAC names of the following compounds:

Q-9 **Give the IUPAC names of the following compounds:**

(a) K_2O

(b) $NaHCO_3$

(c) H_3PO_4

Q-10 **Give the formula of the following compounds:**

(a) Calcium trioxocarbonate(IV)

(b) Sodium trioxophosphate(III)

(c) Potassium oxide

(d) Dihydrogen oxide

Q-11 **Give a brief description of the following states:**

(a) Gaseous

(b) Liquid

(c) Solid

Chapter-6 Gas laws

Q-1 **Choose the correct option.**

Q-2 **A learner investigates the relationship between the pressure and volume of a given mass of gas at constant temperature. She obtains this set of readings:**

P (kPa)	50.0	80.0	120.0
V (m^3)	0.024	0.015	0.010

(a) Using the results, draw a sketch graph.

(b) Explain why the learner can deduce that the gas displays ideal gas behaviour in the experiment.

(c) Give the mathematical relationship in the experiment.

(d) Name the law that is illustrated in this experiment.

Q-3 **A football ball is inflated with air to a pressure of 120 kPa at a temperature of 18 °C. After a tough game of football, the pressure of the air in the football ball increases to 148 kPa. Assume that the ball does not expand.**

(a) Calculate the temperature of the air in the ball at the end of the match.

(b) Is it reasonable to assume that the volume of the ball remained constant? Explain your answer.

(c) If the volume of the ball is 0.400 dm3 , calculate the amount of air required to fill it before the game.

Q-4 **Use Graham's Law to determine which gas of the following pairs of gases will diffuse more readily under the same conditions of temperature and pressure.**

(a) CO2 and Br2

(b) SO3 and Cl2

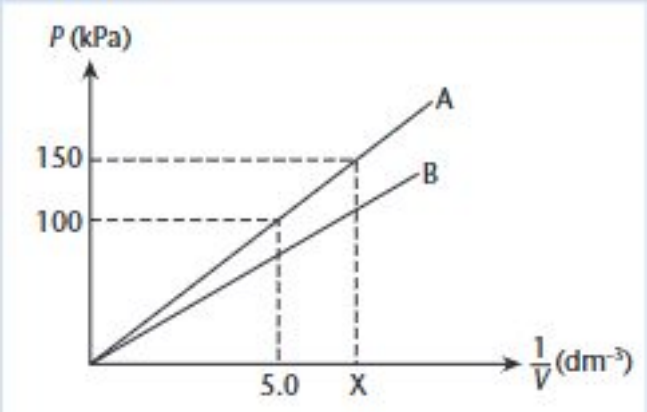
Q-5 **Calculate:**

(a) the number of CO2 molecules in 0.057 mol

(b) the number of atoms in 3 mol of N2

(c) the number of O2 molecules in 1.5 mol.

Q-6 **A group of learners investigated the relationship between volume and pressure of an enclosed gas. The results were used to obtain a graph of pressure against the reciprocal of volume, as shown in the diagram.**



(a) State which factors had to remain constant during this investigation.

(b) Calculate the value of X on the graph for trial A.

(c) Was trial B conducted at a higher or lower temperature than trial A?

Q-7 **Answer the following question.**

(a) Which set of properties of a gas must remain constant in an experiment to verify Boyle's Law?

(b) A gas is collected and found to fill 4.73 cm3 at 35 °C. What will its volume be at standard temperature?

(c) 250 cm3 of hydrogen gas at a temperature of 17 °C are at a pressure of 196 kPa. Calculate the volume of hydrogen if the temperature is raised to 67 °C and the pressure is decreased to 80 kPa.

(d) The pressure of an empty aerosol can that originally contained air freshener is 108 kPa at 21 °C. The can has a volume of 400 cm3 . A boy throws this container into a fire and when the temperature and volume reach 210 °C and 410 cm3 respectively, it explodes. Calculate the pressure in the container just before the explosion.

(e) Calculate the volume at STP of a given mass of gas that occupies 200 dm3 at a pressure of 260 kPa and a temperature of –13 °C

	Constant property			
	Mass (mole)	Pressure	Volume	Temperature
A	✓			✓
B	✓	✓		
C		✓	✓	
D			✓	✓

Chapter-7 Standard separation techniques for mixtures

Q-1 **Classify each of the copper samples underlined below as an element, a compound, a homogeneous mixture, or a heterogeneous mixture.**

(a) Copper metal is a reddish brown substance that cannot be decomposed into simpler substances using chemical methods.

(b) Copper metal reacts with oxygen to form copper oxide.

(c) Brass is an alloy of copper (70%) and zinc (30%).

(d) Copper ore consists of copper minerals and rock.

Q-2 **Provide one term that fits each description.**

(a) Substance made of identical particles

(b) Substance containing different particles

(c) A mixture of gases surrounding us

(d) The separation technique that uses differences in boiling points

(e) Separating technique used to removing chlorophyll pigment from leaves

(f) The process where crude oil is allowed to condense into various liquids, such as gasoline

(g) A liquid in which a substance dissolves

(h) Material deposited on a filter

(i) An insoluble substance that forms during a chemical reaction

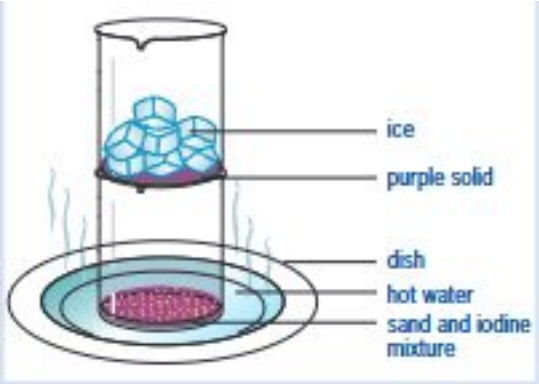
(j) A mixture made of very fine particles that are indefinitely suspended in the mixture

Q-3 **A piece of insoluble powdered chalk is mixed with water in a cup.**

(a) Give two reasons why the cup contains:
i) a mixture
ii) a heterogeneous mixture
iii) a suspension.

(b) Give two possible methods to separate this mixture.

Q-4 **Kemi wants to separate a mixture of iodine and sand. She uses the apparatus as shown below.**



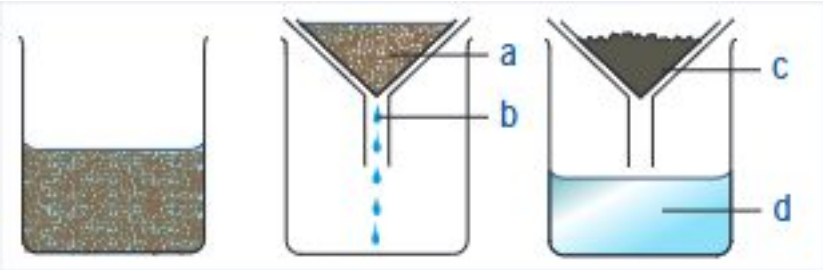
(a) Name the separating technique used by Kemi.

(b) Explain how this technique is used in the experiment.

(c) Name the purple solid indicated on the diagram.

(d) What is the purpose of the ice?

Q-5 **The diagram shows a simple separation technique used in laboratories.**



(a) Name the separation technique

(b) Provide labels for letters a to d.

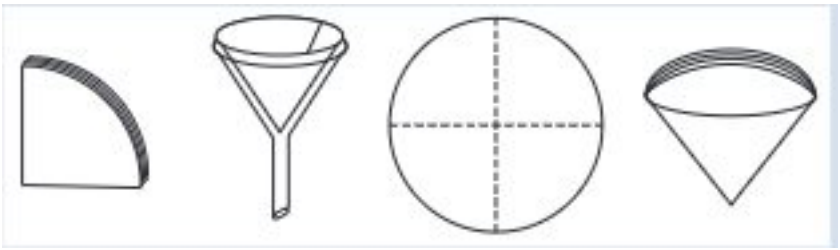
(c) Apparatus a in the diagram above is folded in a specific way before use. Place the folding steps in the correct order.

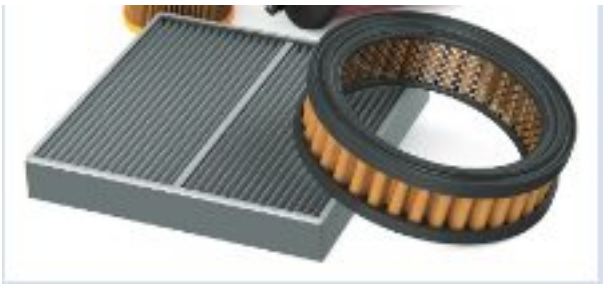
(d) Describe the type of mixture that can be separated by this method.

(e) Why can this method not be used to separate a salt water solution?

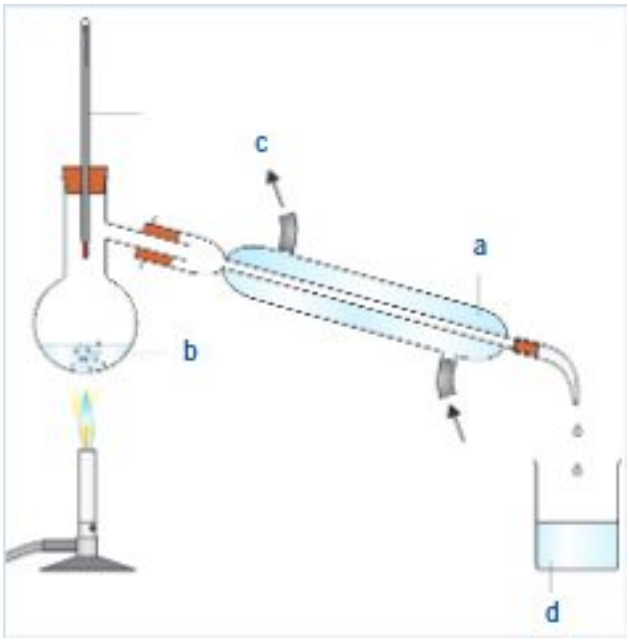
(f) Give one example of using this separation method in your home. Describe the substances that are separated.

(g) All cars have engine air filters, which are a necessary for proper engine operation. What is the main purpose of a car air filter?





Q-6 **The diagram shows a set-up of a simple distillation process.**



(a) Name the substances b and c.

(b) Name the apparatus a.

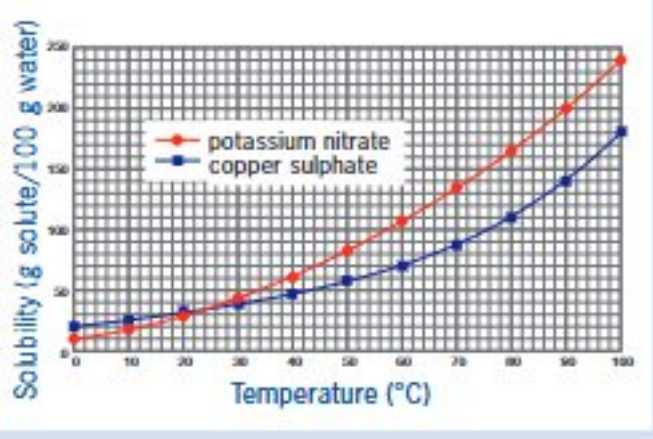
(c) Identify the distillate d collected in the beaker.

(d) How would you determine that the distillate collected is a pure substance?

(e) Briefly explain how this separation technique works.

(f) Boiling chips are sometimes added to the substance in the flask. What is the purpose of this?

Q-7 **An experiment is performed to separate a mixture of sand, potassium nitrate (KNO_3), and copper sulphate pentahydrate ($CuSO_4 \cdot 5H_2O$) based on their solubilities. The solubility curve of potassium nitrate and copper sulphate is shown.**



(a) Explain the general relationship shown by the graphs.

(b) Which of potassium nitrate or copper sulphate is least soluble around 0 °C?

(c) The sand was separated from the solution first. Explain the separating technique that was used.

(d) Then some of the water is boiled away. What is the name of this separating technique?

(e) The solution is then cooled in ice water. Which salt will crystallise first?

(f) What is this special case of the crystallisation separating technique called?

Q-8 **Explain :**

(a) How would you separate a mixture of iron and copper filings?

Q-9 **Chika is asked to separate a mixture of sand and sodium chloride.**

(a) Name the separation methods he needs to carry out.

(b) Explain how he would carry out the methods named in a).

Multiple Choice Questions

Q-1 **To make an emulsion, which of the following substances would be added to water?**

(a) Vinegar

(b) Tea leaves

(c) Alcohol

(d) Petrol

Q-2 **The separation technique that separates liquids using differences in their boiling points is:**

(a) distillation

(b) evaporation

(c) filtration

(d) chromatography

Q-3 **A solid can be separated from a solution using:**

(a) sublimation

(b) condensation

(c) evaporation

(d) decantation

Q-4 **Which of the following statements regarding centrifugation is not true?**

(a) It can be used to remove solid particles from a suspension.

(b) It is used to speed up the settling of a solid.

(c) It uses centrifugal force to move less dense components to the outside of the container.

(d) It separates the components of heterogeneous mixtures.

Q-5 **Crystals can form in a salt solution if:**

(a) more water is added

(b) a saturated solution is cooled

(c) a saturated solution is stirred

(d) a saturated solution is heated

Chapter-8 Acids, bases and salts

Q-1 **Match each term in Column B with the correct description in Column A. Write down only the question number and the letter.**

Column A	Column B
a) A numeric scale that indicates how acidic or basic a substance is	A Carbonate
b) A reaction between an acid and a base that destroys the properties of both	B Indicator
c) A substance that changes colour depending on the pH of a substance	C Neutralisation
d) A substance that dissolves in water to form an alkali	D pH
e) A substance that reacts with an acid to form a gas	E Base

Q-2 **The gastric juice that the stomach secretes contains hydrochloric acid. Sometimes there is an overproduction of hydrochloric acid, leading to heartburn and indigestion. Antacids, such as milk of magnesia ($Mg(OH)_2$), can be taken to neutralise the excess acid.**

(a) Define an acid according to the Brønsted-Lowry theory.

(b) Define a base according to the Brønsted-Lowry theory.

(c) Use a chemical equation to show how hydrochloric acid ionises in water.

(d) Write a balanced chemical equation to show how the antacid reacts with the acid in the stomach.

Q-3 **Name the salts that will form in these reactions:**

(a) $HCl + Zn$

(b) $H_2SO_4 + CuCO_3$

(c) $HNO_3 + NaOH$

Q-4 **Answer the following questions regarding deliquescent, efflorescent and hygroscopic:**

(a) What is called deliquescent? Give examples.

(b) Explain the terms efflorescence and hygroscopic.

(c) How would you demonstrate which property is possessed by washing soda and calcium chloride?

Q-5 **Refer to Table 8.5 and state if the following salts are soluble or insoluble in water:**

Table 8.5 A summary of the solubility of salts in water

Soluble compounds	Exceptions
Almost all salts of Na^+, K^+ and NH_4^+	
All salts of Cl^-, Br^- and I^-	Halides of Ag^+, Ba^{2+} and Pb^{2+}
Compounds containing F^-	Fluorides of Mg^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+} and Pb^{2+}
Salts of nitrates (NO_3^-), chlorate (ClO_3^-), perchlorate (ClO_4^-) and acetate (CH_3COO^-)	Potassium perchlorate ($KClO_4$)
Salts of sulphate (SO_4^{2-})	Sulphates of Sr^{2+}, Ba^{2+} and Pb^{2+}
Insoluble compounds	**Exceptions**
All salts of carbonate (CO_3^{2-}), phosphate (PO_4^{3-}), oxalate ($C_2O_4^{2-}$), chromate (CrO_4^{2-}) and sulphide (S^{2-})	Salts of NH_4^+ and alkali metal cations
Most metal hydroxides (OH^-)	
Most metal oxides (O^{2-})	

(a) BaSO4

(b) (NH4)2 CO3

(c) AgBr

(d) CH3COONa

(e) MgO

Q-6 **Answer the following question :**

(a) What are the general characteristics of acids?

(b) You have two solutions, A and B. The pH of solution A is 6 and the pH of solution B is 8. Which solution has more hydrogen ions in solution? Which one of these is acidic and which one is basic?

(c) Distinguish between the various places where the knowledge of pH values is put to use.

Multiple Choice Questions

Q-1 **Bases colour litmus:**

(a) blue

(b) red

(c) purple

(d) green

Q-2 **Which is NOT a property of acids?**

(a) Bitter taste

(b) Feels rough on the skin

(c) Is corrosive

(d) Turns litmus red

Q-3 **Which is an acidic solution?**

(a) Salt water

(b) Sugar water

(c) Soapy water

(d) Fruit juice

Q-4 **When an acid reacts with a carbonate, the product/s is/are:**

(a) water

(b) water and a salt

(c) water, a salt and carbon dioxide

(d) carbon dioxide

Q-5 **Which liquid CANNOT be used as an indicator?**

(a) Sodium hydroxide

(b) Bromothymol blue

(c) Litmus

(d) Extract from red flowers

Chapter-9 Water

Q-1 **Give one word/term for each of the following descriptions**

(a) The movement of water around Earth by changing phases

(b) Rainwater that is stored in aquifers

(c) Water in rivers, streams, oceans and rain

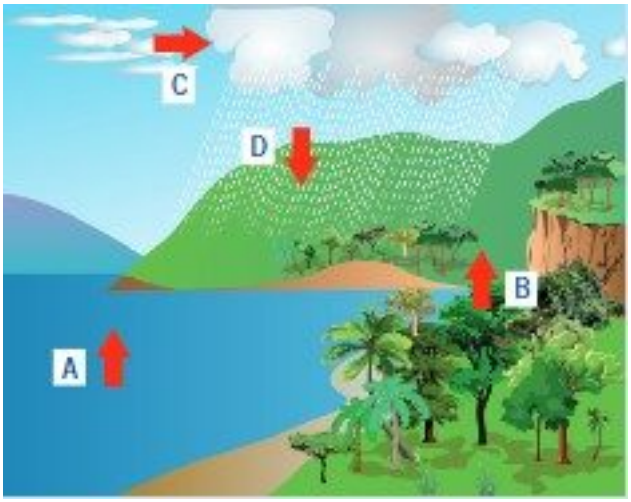
(d) The force between water molecules in liquid water

(e) The process where rivers, streams and the oceans become contaminated

(f) The waste water that contains soap, grease, food and body waste

(g) Water that contains calcium and magnesium ions

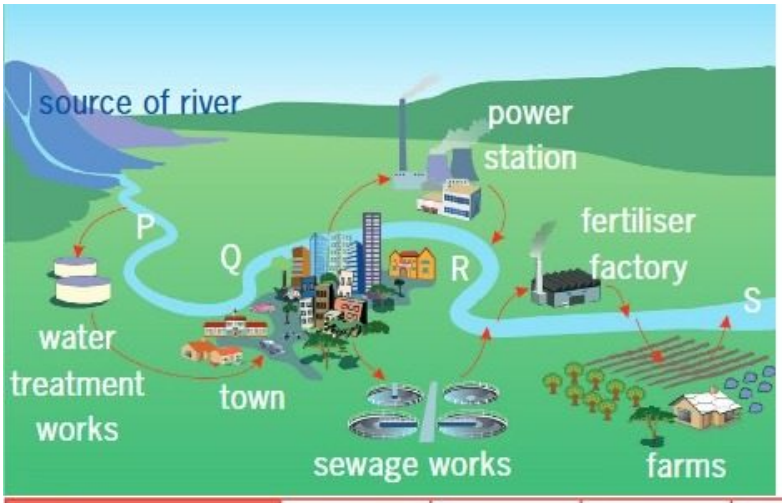
Q-2 **Surface run-off shown in the diagram below is the excess water that flows along streams and rivers and ends up in the sea.**



(a) Identify the processes A, B, C and D.

(b) What is the continuous circulation of water across Earth called?

Q-3 **The diagram shows activities and industries based on a large river. Water samples were collected at sites P, Q, R and S.**



Site	P	Q	R	S
Temperature	8 °C	10 °C	16 °C	14 °C

(a) Why is the town's water supply taken from the river at P and not closer to the town?

(b) Why do you think there is such a big temperature difference between Q and R?

(c) At S, the river is becoming choked with water plants. Why do you think the plants are growing so fast in this section of the river?

(d) The plants at S would normally provide food for fish. But there are no fish in this section of the river. Why do you think this is so?

Q-4 **Bottled water has become very popular.**

(a) Why do you think bottled water is so popular?

(b) Where does bottled water normally come from?

(c) Explain how you would obtain distilled water.

(d) Where do you normally use distilled water?

(e) What is the difference between bottled water and distilled water?

(f) Would it be better for you to drink distilled water instead of tap water?

Q-5 **Some water sources contain water with a high concentration of magnesium and calcium ions.**

(a) What is this type of water called?

(b) Name two detrimental effects of this type of water.

(c) What do we call water that has very little dissolved salts in it?

(d) There are two types of the water named in question a). Explain how you can remove the offending ions in each type.

Multiple Choice Questions

Q-1

Q-2 **The majority of the Earth's water can be found in:**

(a) rivers and streams

(b) groundwater

(c) oceans

(d) lakes

Q-3 **Which is NOT a property of water?**

(a) It does not make a good solvent.

(b) It consists of polar molecules.

(c) It has strong hydrogen forces between molecules.

(d) It has a high boiling point in comparison to other similar molecules.

Q-4 **A positive test for water is when:**

(a) blue copper sulphate turns white

(b) blue copper nitrate turns white

(c) white copper sulphate turns blue

(d) white copper nitrate turns blue

Q-5 **Which is NOT a source of water pollution?**

(a) Sewage

(b) Farming activities

(c) Chemical factories

(d) Water purification plants

Q-6 **Which statement is wrong?**

(a) Temporary hardness is caused by hydrogen carbonate ions in solution.

(b) Temporary hardness can only be removed by ion exchange.

(c) Soft water contains very few dissolved ions.

(d) Permanent hardness cannot be removed by boiling.

Q-7 **Water for use in a laboratory: I can be distilled water II can be de-ionised water III can be tap water IV can be boiled water. The correct options are:**

(a) I and II

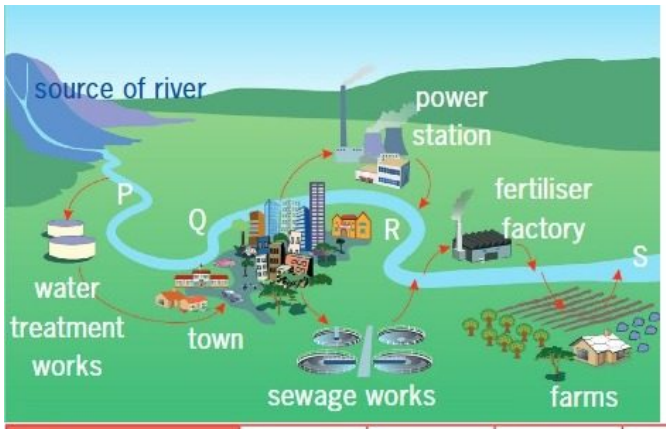
(b) I

(c) I, II and IV

(d) I, II, III and IV

Chapter-10 Carbon and its compounds

Q-1 **Match the statements in Column A with the correct answer in Column B.**



Site	P	Q	R	S
Temperature	8 °C	10 °C	16 °C	14 °C

Column A	Column B
a) Allotrope of carbon	A Coke
b) Class of coal	B Carbon dioxide
c) Product of destructive distillation of coal	C Graphite
d) Dissolves in water to make carbonic acid	D Carbonates
e) The group of compounds that react with an acid to liberate CO_2	E Lignite

Q-2 **Give one term for each description.**

(a) The study of carbon compounds

(b) Atoms of elements that form different molecular forms

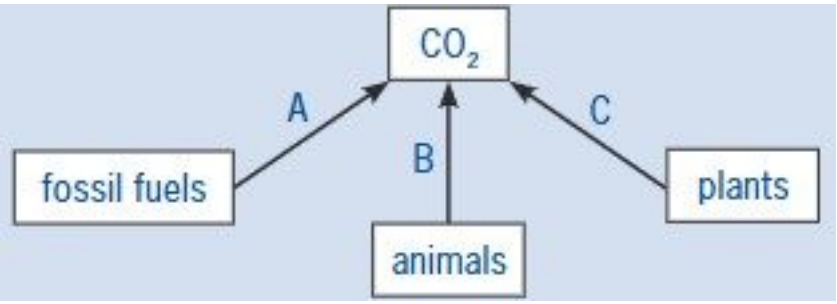
(c) The hardest known natural mineral

(d) The burning of fossil fuels releases excess carbon dioxide into the atmosphere that can cause this global phenomenon

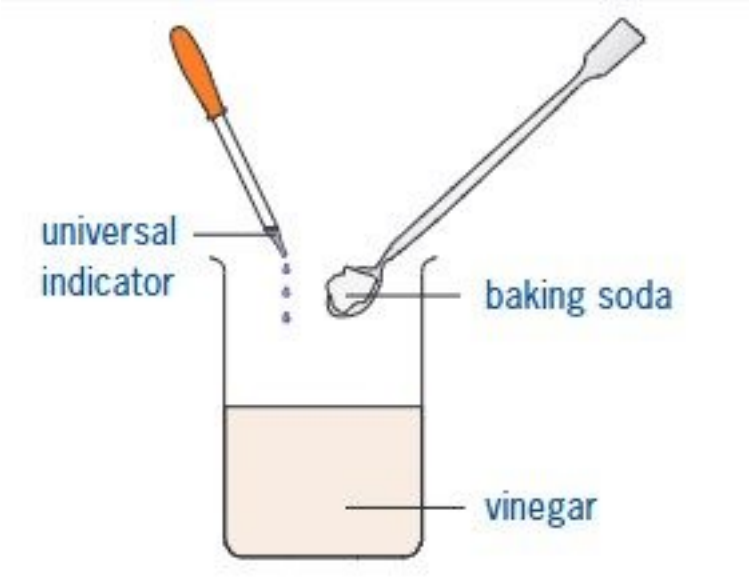
(e) The class of hydrocarbons that has one or more benzene rings

(f) The main component of natural gas

Q-3 **Name the processes labelled A, B and C in the diagram below.**



Q-4 **You want to investigate what happens when vinegar is poured onto baking soda. Your teacher supplies baking soda (NaHCO3), vinegar (CH3COOH) and universal indicator. Below is a diagram of the experimental apparatus.**



(a) Vinegar is an acid and its pH is around 3. What will be the colourof the universal indicator in vinegar?

(b) The baking soda reacts with the vinegar in a neutralisation reaction. Will the pH of the reaction mixture increase or decrease as more baking soda is added to the vinegar?

(c) The colour of the universal indicator finally turns green. What is the final pH of the solution?

(d) Explain what the word 'neutralise' means.

(e) Write a balanced equation for the reaction.

Q-5 **Calcium carbonate can decompose in a kiln at high temperatures.**

(a) Give one common name for calcium carbonate.

(b) Write a balanced equation for this reaction.

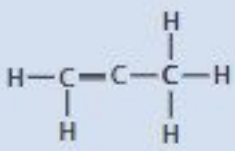
(c) Give the name and formula for clear limewater.

(d) What compound causes the milky colour in limewater?

(e) Which gas causes a positive result in limewater?

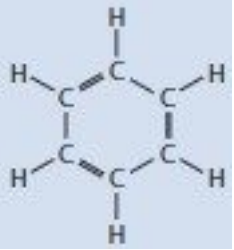
Q-6 **Name the compounds below.**

a)

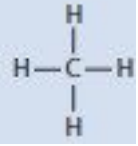


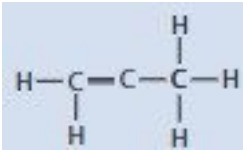
b)

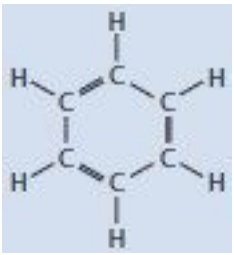
c)

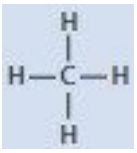


d)









Q-7 **Fossil fuels are the main source of energy on Earth.**

(a) Name three fossil fuels.

(b) Why are fossil fuels non-renewable?

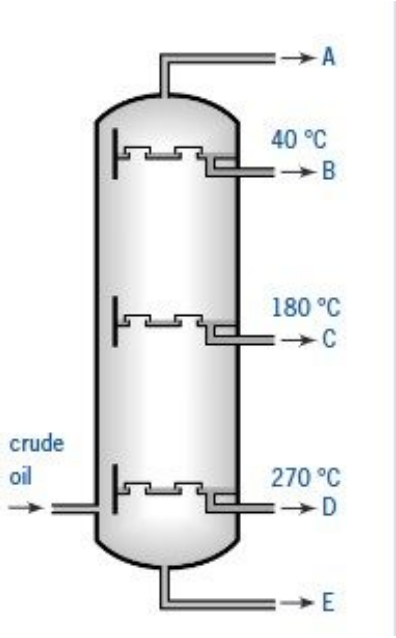
(c) Describe the formation of fossil fuels.

(d) Name the process whereby plants store energy from sunlight.

(e) Name the process whereby energy stored in fossil fuels is released through burning.

(f) What substance is needed for the previous process to take place?

Q-8 **The compounds in crude oil are separated in a refinery by means of the apparatus shown in the diagram.**



(a) What is the name of the apparatus?

(b) What is the name of the process that is used to separate the compounds in crude oil?

(c) Which physical property of the compounds in the mixture is usedfor the separation?

(d) Use the letters A to E to describe where the following could be found:
i) The fraction that represents gases
ii) The fraction with the largest molecules
iii) The fraction that represents liquids with the lowest boiling point
iv) The fraction that is used to tar roads
v) The fraction used as diesel
vi) The fraction used as petrol
vii) The fraction that is used to make candles
viii) The fraction that is used as domestic kerosene

Multiple Choice Questions

Q-1

Q-2 **Which is NOT a biological polymer found in living organisms?**

(a) Carbohydrates

(b) Lipids

(c) Nucleic acids

(d) Phosphates

Q-3 **Which is a property of diamond?**

(a) Electrical conductor

(b) Thermal conductor

(c) Brittle

(d) Atoms form hexagonal rings

Q-4 **Which is NOT considered a class of coal?**

(a) Peat

(b) Anthracite

(c) Bituminous coal

(d) Lignite

Q-5 **Which is NOT a use of carbon dioxide?**

(a) To make washing soda

(b) Used in a fire extinguisher

(c) Used as reducing agent to smelt iron ore

(d) As coolant to preserve meat

Q-6 **Which compound is NOT a component of synthesis gas?**

(a) CO

(b) H_2O

(c) CO_2

(d) CH_4

Q-7 **When an acid reacts with a carbonate, the product(s) are/is:**

(a) water

(b) water and a salt

(c) water, a salt and carbon dioxide

(d) carbon dioxide