Time: 2 ½ hours

INSTRUCTIONS. S2 MARKING GUIDE

- **This paper consists of two sections A and B.**
- **Attempt all questions from section A and any 2(two) in section B.**
- **Answer to section A must be written in the spaces provided.**

SECTION A

1. When substances are burnt in air, they react with one of the components of air.

   (a)Identify this component of air and its percentage. (1mark)

   .....Oxygen..;...21%.....

   (b)Write word equations to show how the following elements react with the component of air in (a) above.

   (i) Carbon (1mark)

   acc; Formation of CO

   ...Carbon..+..Oxygen.....⟶..Carbon-dioxide.....

   (ii) Sodium. (1mark)

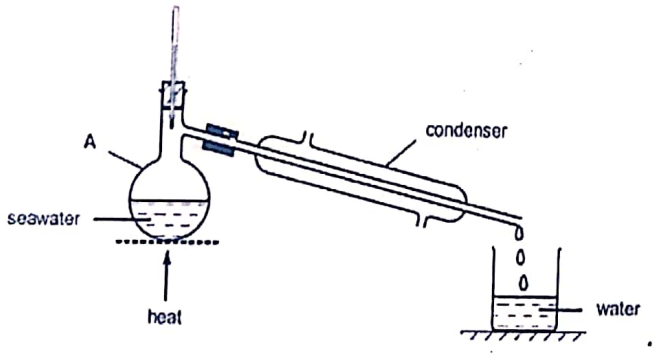
   acc; Sodium peroxid

   ...Sodium...+..Oxygen.....⟶..Sodium...oxide.....

   (ii) Calcium (1mark)

   ...Calcium..+..Oxygen.....⟶..Calcium oxide.....

2. Sea water is said to be salty and does not quench thirst, students took a sample of sea water and heated it using the apparatus shown below.



   (i)What is the name of the process shown in the diagram? (01mark)

   acc; distillation deny; fractional distillation

   ....Simple..distillation.....

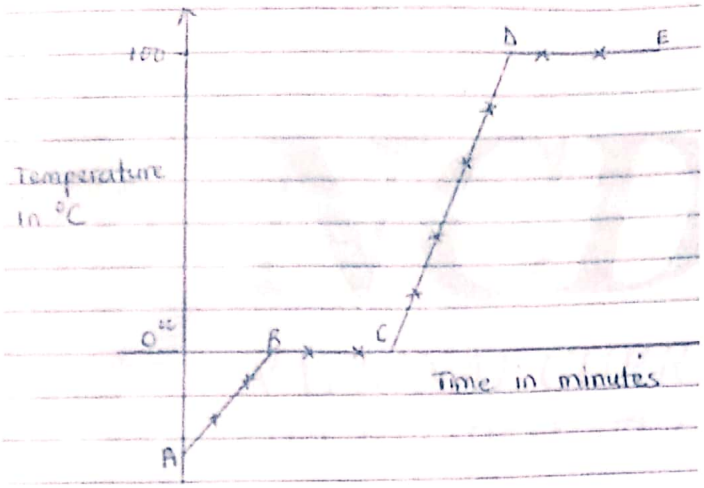
   (ii)State the name of the apparatus labeled A. (01mark)

   .....Round..bottomed..flask..... Acc; distillation flask

   (ii) Explain the function of the condenser. (01mark)

   ..Cools..down...the..water..vapour;..condensing..it..to..liquid water.

3. The graph below shows heating of ice until boiling starts.



(a)Briefly state what happens in regions.

(i)AB

.....Ice..gains...heat/..temperature.....(01mark)

(ii)BC

Acc Ice turns to liquid water

.....Ice...melts...to...water.....(01mark)

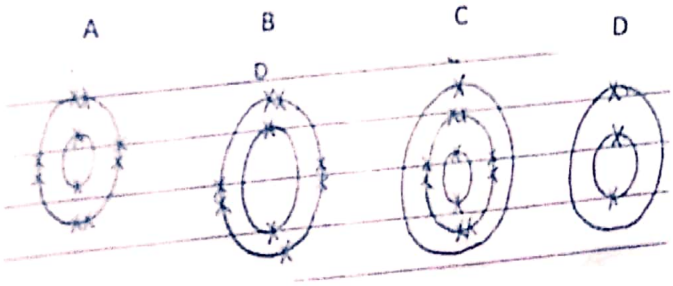
(iii)CD

.....Water...gains...heat/..temperature.....(01mark)

(iv)DE

.....Water....evaporates/...turns..to...gaseous..state...(01mark)

4. In the study of elements and other substances in chemistry, a periodic table is used in the classification of elements according to their atomic number. Below are some of the electronic structures of different elements. Use them to answer the question below



(i) Which one of the following structures A-D represents a noble gas ($^1/_2$mark)

.....A.....

(ii)Which two of these represents atoms from the same group of the periodic table? (02mark)

.....

.....C...and...D.....

(iii)With a reason which of these structures represents an atom in period 3 of the periodic table. (01½marks)

.....C...because...it...has...3.energy...levels...acc;..shells...

.....k

5. (a) Acids react with bases to form a salt and water only, state the names of the salts obtained from the following reactions.

(i)Zinc metal +dilute hydrochloric acids. (01mark)

.....Zinc.chloride.....

(ii) Copper (ii) oxide +dilute hydrochloric acid. (01mark)

.....Copper(ii).chlaride.....

(b)Write word equations for the reactions when the following substances react

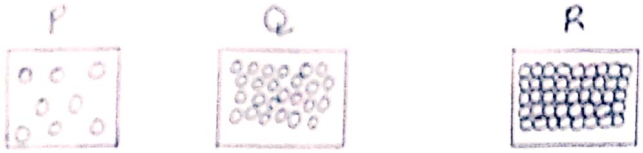
(i) Dilute nitric acid and calcium carbonate. (01mark)

Dilute..nitric..acid.t.Calcium..carbonate...→..Calcium.nitrate.t..water + Carbon-dioxide

(ii)Dilute hydrochloric acid and magnesium. (01mark)

Dilute..hydrochloric..acid.t.Magnesium...→..Magnesium.chloride + Hydrogen

6. Matter is anything that occupies space and has weight.



(i)Name the states of matter

P (01mark)

.....Gas.....

Q (01mark)

.....Liquid.....

R (01mark)

.....Solid.....

(b) Stating whether heat is gained or lost in the process, name the process for the change of state of matter from P to R (01mark)

...Sublimation.; heat is ~~gained~~ lost.....

7. With reference to question **SIX**. Using particle theory of matter explains why you can easily squeeze a plastic gas syringe that is completely filled with air, than that filled with water. (04marks)

.Gas particles are sparsely arranged; squeezing brings them closer to one another reducing their volume: while liquid/ water molecules are closely packed; can't be brought any more closer.....

8. In our day to day life we use different materials such as concrete, metallic materials, plastics and rubber in different areas basing on their properties stating a property in each case state area where these materials are used.

(i)Wood (02mark)

Acc. learners answer if property matches with the function

..light when dry; used as building materials.....

..Can easily be bored; use in furniture.....

(ii)Plastic (02mark)

...light.; used for making chairs; utensils and shoes.....

...Poor conductor of heat and electricity; used as insulators

9. Carbon dioxide gas can have harmful effects to human life , there are also ways how carbon dioxide can be beneficial in human life and industries. State any 4 ways how carbon dioxide is used in our daily life. (04marks)

Acc any 4

...Putting off fire in fire extinguishers.....

...Plants for photosynthesis.....

...Used in refrigerators.....

...Used in aerated drinks like Soda.....

10. With reference to question **NINE** above, explain how an increased amount of carbon dioxide leads to global warming. (04mark)

..Accumulation of carbon dioxide in the atmosphere forms a blanket layer on the earth preventing loss of the earth's heat radiations; bouncing it back to the earth thus increasing the earth's Temperature

S2 CHEMISTRY SECTION B

No 11 DATE __/__/__

- Recycling; to restrict/prevent over exploitation of petroleum
- Reuse some of the plastic materials in order to prevent over exploitation of petroleum
- Encourage use of alternative sources of energy like solar and biogas
- Educate people of the dangers of over exploitation of the natural resources and the goods of conservation of resources for future use and on the environment
- Use of fuel saving devices like charcoal saving stoves
- Encouraging people to plant trees ie re-aforestation and aforestation
- Invention of electric and solar automobile to prevent over exploitation of petroleum.
- Lowering the prices of electricity to encourage the people use it for domestic use like cooking in order to check on enchroachment on plants.
- Rural electrification in order to reduce on the excessive use of fire wood, charcoal and petroleum as fuel in rural areas.

Acc. any 10 ways of conserving plants and petroleum

DATE__/__/__

NO 12

I would use filtration and crystalisation methods

A procedure to purify salt mixed with sand

materials

- water
- Sieve/clean piece of cotton cloth
- 2 big source pans
- Heat source
- big spoon

Procedure

In one of the big source pan dissolve the salt-sand mixture where only salt dissolves.

~~Transfer the~~ Filter the mixture using a sieve or a clean piece of cotton cloth

Tranfer the filtrate to a clean large source pan on the heat source.

Boil/heat the mixture with regular stiring using a spoon until when salt crystals begin to form on the cooled spoon

Remove the new super saturated solution from the heat source an cool it as salt crystals form

Dry the salt crystals and repack them into their suck.

This way I would have saved my father from wasting money on buying more salt.

DATE __/__/__

NO 13 (ii)

- Used in the manufacture of aerated drinks like soda and alcohol
- Used in the manufacture of agrochemicals increasing agricultural produce both plants and animals
- Used in pharmaceutics to make drugs/medicines which has improved people's health.
- Used in food industries to process different foods like Supagatti, bread, biscuits and son many others
- Used in production of different products like home utensils and packaging materials like polythene.
- Used in cosmetics industries to improve on peoples appearance
- In all the sectors where this knowledge is applied jobs are provided to people in the society.

Acc. any 5 importances of the knowledge of chemistry in the society

DATE __/__/__

14 (a) (i)

A; 2)7
B; 2)8)2
C; 2)6
D; 2)4

14 a (ii)

B is a metal; it has 2 electrons in the outer most energy level
A, C and D; are non-metals; has between 4 to 7 electrons in the outer most enery level

14 a (iii)

A^-
B^{2+}
C^{2-}
D^{4-}

14 b (i)

Amorphus carbon
Fullerenes

14 b(ii)

Diamond	Graphite
- Poor conductor of heat and electricity - Trasparent - Hard - Has no free mobile electrons	- Good conductor of heat and electricity - Translucent - Soft - Has free mobile electrons