

Name..... stream.....

S2 CHEMISTRY END OF YEAR EXAMINATION – 2022

Time: 2 hours

INSTRUCTIONS

Attempt all questions in section A

Choose only 2 questions in section B

SECTION A (*Attempt all questions in this section*)

1. (a) Why, is Chemistry called a laboratory science? (1 mark)

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- (b) Physics deals with the relationship between energy and matter, Biology deals with living things.
What does Chemistry deal with? (2 marks)

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.....

- (c) Identify the areas in Chemistry which contribute to the economy of Uganda. (3 marks)

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2. Which piece of laboratory apparatus would be most suitable for each of the following activities? (05 marks)

(i) Holding 50 cm³ of boiling water.

(ii) Pouring 50 cm³ of acid from one container to another.....

(iii) Measuring exactly 30 cm³ of water.....

(iv) Removing substances from a reagent bottle.....

(v) Weighing 100 grams of sodium chloride.....

3. (a) State four states of matter (4 marks)

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- (b) Define the term diffusion (1 mark)

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(c) Use the idea of diffusion to explain how the smell of perfume travels (3 marks)

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3. Draw a table with two columns labelled physical change and chemical change. Write down each of the following changes in the correct column: water boiling; a car rusting; petrol burning; sugar dissolving in tea; food being digested; bleach cleaning a dirty cloth; beer fermenting; ice cream melting; wind blowing; milk turning sour; seawater evaporating.

4. Here is part of the label on a packet of potato chips.

Nutritional information	Per 100g
Calcium	100 mg
Magnesium	125 mg
Iron	27 mg
Phosphorus	420 mg

Use the table above to answer these questions:

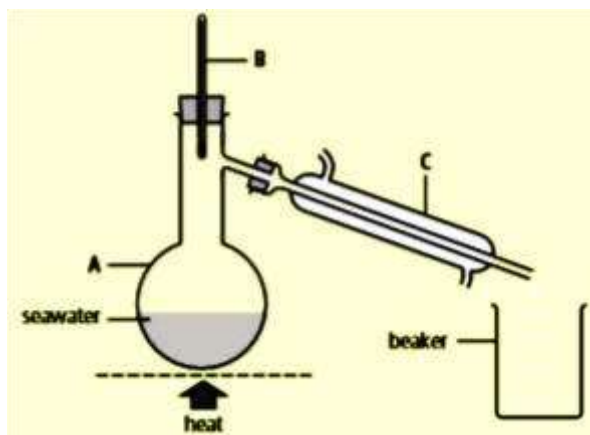
a) Write down the chemical symbols for calcium, magnesium, iron and phosphorus (2 marks)

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- b) These substances are all elements, but one is different from the other three. State which one is different and describe what it is that makes it different. (2 marks)

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5. Seawater can be purified using this apparatus:



- a) i) What is the maximum temperature recorded on the thermometer, during the distillation? (1 mark)

.....

- ii) How does this compare to the boiling point of the seawater? (1 mark)

.....

- b) In which piece of apparatus does evaporation take place? Give its name. (1 mark)

.....

- c) i) Which is the condenser: A or B or C? (1 mark)

.....

- .ii) Where does the supply of cold water enter? (1 mark)

.....

- d) Distillation is used rather than filtration to purify seawater for drinking. Why? (2 marks)

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6. (a) The problem of water pollution is slowly but steadily ravaging some parts of our country. Describe one method you can use to purify water at home. (1 mark)

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(b) Describe the human activities that can cause water pollution. (3 marks)

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(c) What are some of the solutions to the problem of water pollution? (3 marks)

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7 (a) From your knowledge of rocks and minerals. Name two examples of minerals. (2 marks)

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(b) How do people use rocks? (3 marks)

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(c) What forces cause metamorphic rocks to form? (1 marks)

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8. You are required to carry out an experiment that requires an acid base indicator. In case your school laboratory does not have an acid base indicator. Explain how you can improvise one to use in your experiment.

(a) State one importance of an acid base indicator (1 mark)

.....

(b) Name two indicators commonly found in the laboratory (2 marks)

.....

 (c) Complete the passage below using the words given. You can also use your knowledge of acids and alkalis to fill the gap if the word suitable is not provided to you. (4 ½ marks)

(Water, eleven, hydrogen, smaller, citric, acidic sodium hydroxide)

An acid is a substance that when dissolved in water produces.....ions as the only positively charged ions. Some acids are natural such as acid found in lemon juice whereas acids found in the laboratory are called mineral acids because they are.....from minerals or non-living things. These acids include;.....acid, acid andacid.

The P^H scale reflects the relative amount of free hydrogen and hydroxide ions in a solution.

The more the hydrogen ions, the more..... and thethe P^H . Strong bases such as potassium hydroxide and have P^H values which are above Let's not forget this important liquid of our life calledwhich has a neutral P^H of 7 when pure.

9. (a) What is the impact of burning carbon fuels to the environment? (2 marks)

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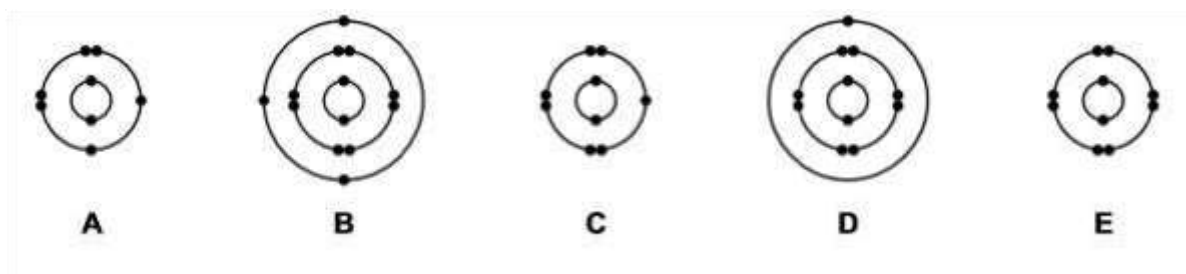
(b) Why is it not recommended to cook in a poorly ventilated room? (3 marks)

.....

(c) Giving an examples, distinguish between a renewable and non-renewable fuel. (4 marks)

.....

11. The figure below shows the electronic structures of five atoms, A, B, C, D and E.



(a) Answer the following questions. . Each letter may be used once, more than once or not at all.. Give the letter of the atom, A, B, C, D or E, that:

(i) is in Group III of the Periodic Table (1 mark)

.....

(ii) has 13 protons (1 mark)

.....

(iii) is a noble gas (1 mark)

.....

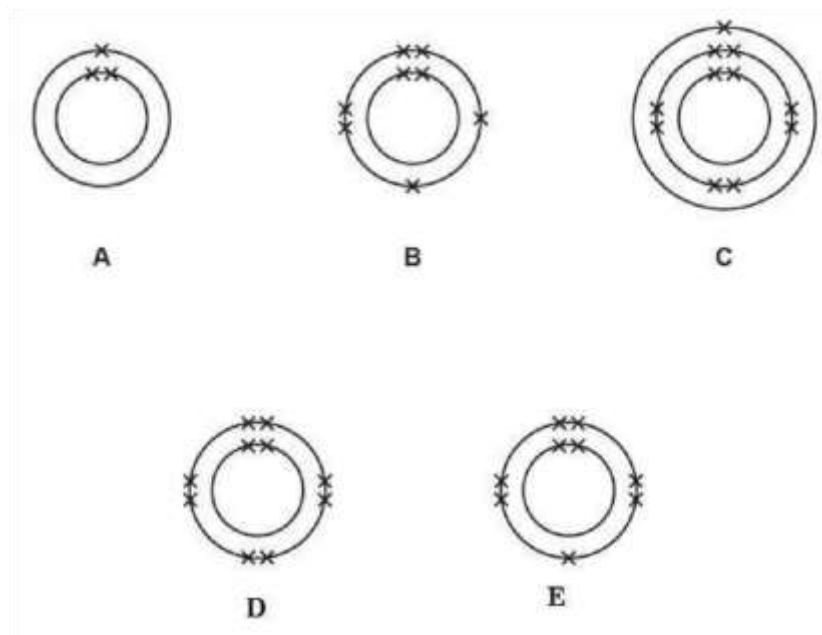
(iv) Forms a stable ion with a single negative charge. (1 mark)

.....

(b) What is missing in all the electronic structures above? (1 mark)

.....

12 (a) The electronic structures of various atoms are shown below



(i) Which one of these structures A to E represents a noble gas? (01 mark)

.....

- (ii) Which two of these structures represent atoms from the same Group of the Periodic Table? (02 marks)

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- (iii) Which one of these structures represents an atom with an atomic number of 8? (1 mark)

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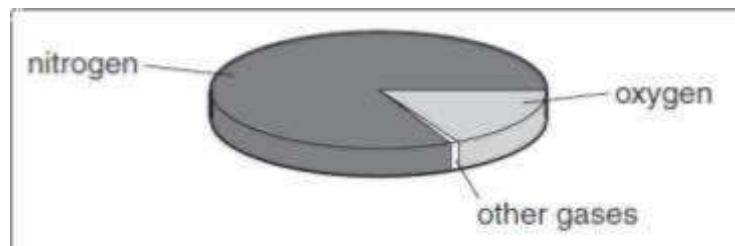
- (iv) Which one of these structures forms a stable ion by gaining one electron? (1 mark)

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- (v) Which one of these structures is in Period 3 of the Periodic Table? (1 mark)

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13. The pie chart shows the composition of air.



- (i) What is the percentage of nitrogen in the air? (01 mark)

.....

- (ii) Apart from nitrogen and oxygen, state the names of two gases present in unpolluted air. (02 marks)

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SECTION B (*Attempt any two questions*)

14. In a certain village called Bileafe where much tobacco is grown bought vehicles after tobacco sales. However, no sooner than later many of the vehicles either broke down or they were parked at home since fuel became expensive to afford.

TASK

As a student of chemistry, develop a message for the owners of the cars in this village explaining why the vehicles should be kept well even if they are spoilt, where they should be kept, and what kind of change they will undergo if not properly kept. (10 marks)

15. (a) Read the passage below and answer the questions that follow.



Almost all the industries produce poisonous chemicals as their waste products.

These are called chemical waste or industrial wastes. These wastes are discharged untreated in nearby water bodies. In this way, the water bodies get polluted with chemicals. The chemicals present are the compounds of harmful metals such as mercury, cadmium, lead, arsenic and nickel. These may also include detergents and polychlorinated biphenyls (PCBs). These chemicals can kill aquatic animals and plants. They also cause severe disorders in humans such as cancer and nervous disorders.

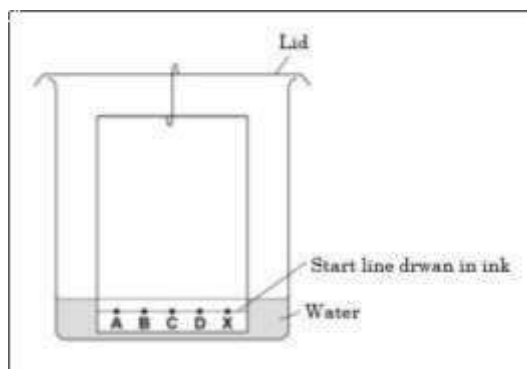
- (i) Give a suitable title to the passage above. (01 mark)
- (ii) What does it mean by chemical waste? (01 mark)
- (iii) Chemical waste can cause And.....
in humans. (02 marks)
- (iv) Compounds of which elements are present in chemical waste? (03 marks)
- (v) In which area could the photograph have been taken from in Uganda? (01 mark)

(b) Explain briefly Why polythene should be banned in Uganda? (02 marks)

16. (a) A student investigated food dyes using paper chromatography.

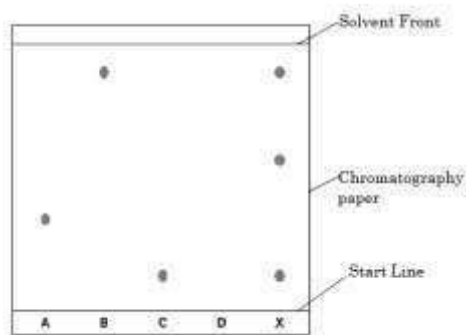
This is the method used

1. Put a spot of food colouring X on the start line.
2. Put spots of four separate dyes, A, B, C and D, on the start line.
3. Place the bottom of the paper in water and leave it for several minutes. *Figure shows the apparatus the student used.*



(ii) Write down one mistake the student made in setting up the experiment and explain what problems one of the mistakes would cause. (01 mark)

(b) Another student set up the apparatus correctly, Figure below shows the student's results. The result for dye D is not shown



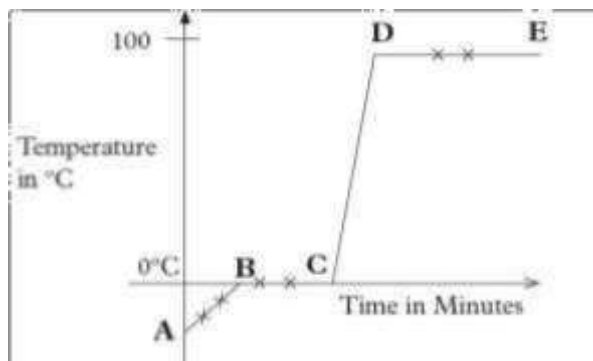
(iii) Calculate the R_f value of dye A Give your answer to two significant figures.

(02marks)

(iv) Explain how the different dyes in X are separated by paper chromatography

(03 marks)

(b) The graph below shows heating of ice until boiling starts.



(i) Briefly state what happens in regions: (04 marks) o AB o BC o CD o DE

END