NAME/ EXAMINATION NO.: _____ CLASS _____

CHINSAPO CLUSTER MOCK EXAMINATION

2022 JUNIOR CERTIFICATE EXAMINATION

CHEMISTRY

(100 marks)

Subject Number: J038

Date: _____

Time Allowed: 2 hours

Instructions

1. **This paper contains 11 printed pages. Please check.**

2. Fill in your **Examination Number** at the top of each page.

3. Answer all the **33** questions.

4. This paper contains **S**ections **A**, **B** and **C**. For Section A, encircle the letter representing the right answer to each question. Section **B** and **C** should be answered in the spaces provided.

5. In the table provided on this page, tick against number of the question you have answered.

6. Hand in your paper to the invigilator when time is called to stop writing.

Question Number	Tick Qns 21 to 33 If answered	Do not write in these column	
1-20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
31			
32			

NAME/ EXAMINATION NO.: _____ CLASS _____

Section A (20 marks)

There are twenty questions in this section. Encircle the letter of your choice representing the right answer.

Figure 1 is a diagram of a laboratory content. Use it to answer Question 1 and 2.

Figure 1

1. What is the name of the apparatus?
   A. Erlenmeyer flask
   B. Florence Flask
   C. Boiling flask
   D. Volumetric flask
2. What is it used for in chemistry laboratory?
   A. Used for preparing solutions.
   B. Used for boiling chemicals.
   C. Used for mixing chemicals.
   D. Used heating chemicals.
3. How many significant figures are there in 0.040400?
   A. Three C. Five
   B. Four D. Six

Table 1 shows melting and boiling points of different alkanes. Use it to answer Questions 4 and 5.

Table 1

Alkane	Melting point (℃)	Boiling point (℃)
Methane	-182.46	-162
Ethane	-183.26	-89
Propane	-187.6	-42
Butane	-138.36	-0.5
Pentane	-129.76	36

4. Which alkane is a liquid at room temperature?
   A. Methane C. Butane
   B. Pentane D. Ethane
5. Which alkane has the lowest melting point?
   E. Methane C. Propane
   F. Ethane D. Pentane
6. The law of conservation of energy states that energy
   A. Created is more than energy destroyed
   B. Destroyed is more than energy created
   C. Is neither created nor destroyed
   D. Is destroyed and created

The reaction between propene (C_3H_6) and bromine (Br_2) is represented by the following chemical equation

$C_3H_6 + Br_2 \rightarrow X$. Use the equation to answer Questions 7 and 8.

7. What is the chemical formula for the substance X?
   A. $C_3H_5Br_2$ C. C_3H_6Br
   B. $C_3H_6Br_2$ D. C_3H_5Br
8. This type of reaction is called
   A. Combustion reaction
   B. Neutralisation reaction
   C. Addition reaction
   D. Substitution reaction
9. Which of the following are advantages of using tables when presenting experimental data?
   1. They provide order in which data is recorded
   2. They average out errors in the data
   3. They allow patterns in the data to be easily deduced
   4. They encourage a scientist to present and organize data in an orderly manner

   A. 1, 2 and 3 C. 1, 3 and 4
   B. 1, 2 and 4 D. 2, 3 and 4
10. Given the following metals; Na, K, Al, Ca and Mg. Which of the following is the correct arrangement of metals in order of increasing reactivity
    A. Na, Al, Ca, Mg, K
    B. Ca, Mg, Al, K, Na
    C. Al, Mg, Ca, Na, K
    D. K, Na, Ca, Mg, Al

Figure 2 is a diagram of a distillation apparatus. Use it to answer Questions 11 and 12.

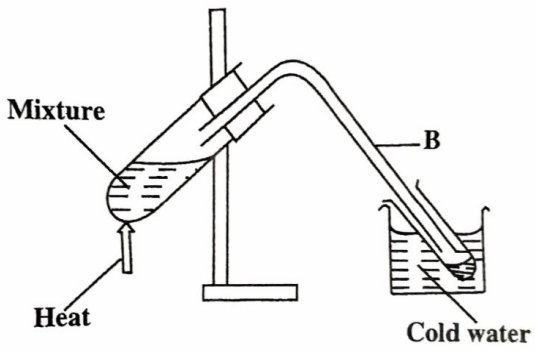


Figure 2

11. Name the part labelled **B**
    A. boiling tube
    B. delivery tube
    C. receiving tube
    D. capillary tube
12. What happens if the cold water is replaced by hot water?
    A. Distillate will contain impurities
    B. More distillate will be produced
    C. Amount of distillate will be the same
    D. Less distillate will be collected

Figure 3 is a graph of temperature against time for candle wax that was being heated. Use it to answer Questions 16 and 17.

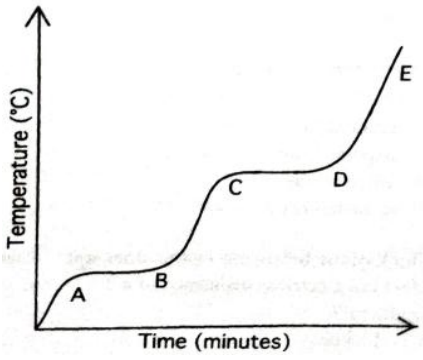


Figure 3

13. In which state of matter was the candle wax between points B and C?

A. Solid C. Gas
B. Liquid D. Liquid and gas

14. Why does temperature remain constant between points **A** and **B**?
    A. Heat supplied is constant at that temperature.
    B. It is a maximum temperature a substance can reach.
    C. Heat supplied is used to create a new bonds.
    D. Heat supplied is used to arrange the molecules into another state.
15. Which of the following will be the second distillate in fractional distillation of petroleum?
    A. $C_{10}H_{22}$ C. C_5H_{12}
    B. C_6H_{14} D. CH_4
16. Why potassium conducts electricity?
    A. Because it is soft.
    B. Because it is silvery when freshly cut.
    C. Because it has free electrons.
    D. Because it loses one electron.

Table 2 shows results of an experiment on acids and bases. Use it to answer questions 17 and 17

Table 2

Substance	Effects on universal indicator
W	Turned red
X	Turned purple
Y	Turned orange
Z	Blue

17. Which substances are acidic?
    A. W and X C. X and Y
    B. Y and Z D. W and Y
18. Which substances is the most basic?
    A. W C. Y
    B. X D. Z
19. Which of the following is the correct order of activities in a scientific investigation?
    A. Selecting variables, identifying a problem, formulating hypotheses and controlling variables.
    B. Controlling variables, selecting variables, identifying a problem and formulating hypotheses.
    C. Formulating hypotheses, controlling variables, selecting variables and identifying a problem.
    D. Identifying a problem, formulating hypotheses, selecting variables and controlling variables.
20. Which of the following can be used to determine the strength of an acid?
    1. Universal indicator
    2. Phenolphthalein indicator
    3. Screened methyl orange
    4. Conductivity test

    A. 1 and 2 C. 2 and 3
    C. 3 and 4 D. 1 and 4

NAME/ EXAMINATION NO.: _____ CLASS _____

Section B

Structured questions (50 marks)

Answer **all** questions in this section in the spaces provided

21. a. (i) What is air?

_____ (1 mark)

(ii) Why is carbon dioxide gas used as a fire extinguishing gas?

_____

_____ (2 marks)

b. (i) Explain why nitrogen is used to fill empty tankers instead of oxygen despite both being gases

_____

_____ (2 marks)

(ii) Given a sample of gas suspected to be oxygen, describe how you can test for the gas.

_____

_____

_____ (2 marks)

22. a. Define an element.

_____ (1 mark)

b. (i) Mention two examples of gas in liquid solution.

_____ (2 mark)

(ii) Explain one difference between homogeneous and heterogeneous mixture.

_____

_____

_____ (2 marks)

NAME/ EXAMINATION NO.: _____ CLASS _____

23. a. Balance the following chemical equation:

C_4H_{10} (aq) + O_2 (g) → CO_2 (g) + H_2O (l) (2 marks)

b. Work out the percentage composition by mass of chlorine in CH_2Cl_2

(2 marks)

c. Explain how pressure is a factor that affect solubility of substances.

_____

_____

_____ (2 marks)

24. a. What is a metalloid?

_____ (1 mark)

b. Given that silicon is metalloid, explain how you can make it conduct electricity.

_____

_____ (2 marks)

c. Explain the difference between ionization energy and electron affinity in terms of electron transfer.

_____

_____ (2 marks)

NAME/ EXAMINATION NO.: _____ CLASS _____

25. a. Mention any two uses of lithium

_____

_____ (2 marks)

b. Explain the trend of reactivity of halogens down the group.

_____

_____ (2 marks)

c. Explain why helium is used in filling weather balloon in steady of hydrogen despite hydrogen being lighter than helium.

_____

_____ (2 marks)

26. Figure 4 is a diagram showing a method of separating mixtures.

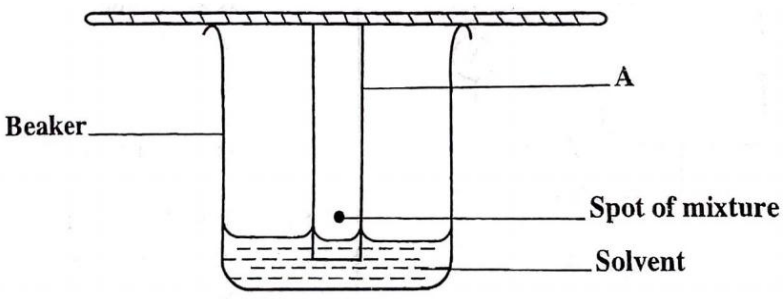


Figure 4

a. (i) Name the method of separating mixture shown in figure 4.

_____ (1 mark)

(ii) Identify the part labelled A

_____ (1 mark)

b. What happens to the spot after sometime?

_____ (1 mark)

c. Explain why the spot is put above the solvent level in the beaker.

_____

_____ (2 marks)

27. a. What is chemical bonding?

_____ (1 mark)

b. Why atoms participate in the chemical bonding.

_____ (1 mark)

c. Using dot and cross diagram, draw the structure of lithium oxide (Li_2O)

(2 marks)

28. a. Define soil pollution?

_____ (1 mark)

b. Explain how each of the following is a source of pollution

i. Aerosols

_____

_____ (2 marks)

ii. Oxides of sulphur

_____

_____ (2 marks)

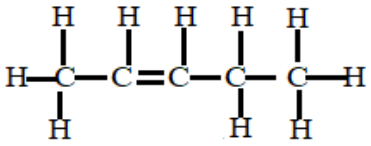
c. Explain the importance of organic matter in the soil

_____

_____ (2 marks)

NAME/ EXAMINATION NO.: _____ CLASS _____

29. a. Write the molecular formula of a compound with the following structure



_____ (1 mark)

b. State any two uses of alkenes

_____

_____ (2 marks)

c. Explain why alkenes are more reactive than alkanes

_____

_____

_____ (2 marks)

Section C (30 marks)

Answer **all** questions in this section in the spaces provided

30. a. With the aid of a balanced chemical equation explain how ethene is produced from ethanol.

_____

_____

_____

_____

_____

_____ (4 marks)

b. Explain any three application of neutralization reactions in everyday life

_____

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_____ (6 marks)

31. a. Describe an experiment that you would carry out in order to demonstrate the evidence of molecular motion in a gas.

_____

_____

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_____ (5 marks)

b. Describe an experiment that can be carried to determine the percentage of moisture content in soil.

_____

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_____

_____ (5 marks)

NAME/ EXAMINATION NO.: ___________________________________ CLASS _________

32. Describe an experiment to determine the strength of sulphuric acid and ethanoic acid using magnesium strip. Include procedure, results and conclusion.

____ (10 marks)

END OF QUESTION PAPER

This paper contains 11 printed pages.