GENERAL CERTIFICATE OF EDUCATION (GCE) BOARD

General Certificate Of Education Examination

0515 CHEMISTRY 1

JUNE 2021 **ORDINARY LEVEL**

Centre Number	
Centre Name	
Candidate Identification Number	
Candidate Name	gcerevision.com

Mobile phones are NOT allowed in the examination room.

MULTIPLE CHOICE QUESTION PAPER

One and a half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed **"Ordinary Level – 0515 Chemistry 1"**
4. Fill in the information required in the spaces above.
5. Fill in the information required in the spaces provided on the answer sheet using your HB pencil: **Candidate Name, Exam Session, Subject Code and Candidate Identification Number.** Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.

How to answer the questions in this examination

6. Answer **ALL** the **50** questions in this Examination. All questions carry equal marks.
7. Non-programmable Calculators are allowed.
8. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide which answer is appropriate. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.

   For example, if **C** is your correct answer, mark **C** as shown below:

   [A] [B] [C] [D]

9. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
10. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
11. Do all your rough work in this booklet using the blank spaces in the question booklet.
12. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT.**

Relative Atomic Masses

Nitrogen (N) = 14.0
Hydrogen (N) = 1.0
Oxygen (O) = 16.0
Carbon (C) = 12.0
Sodium (Na) = 23.0
Magnesium (Mg) = 24.0
Avogadro Number = 6.0×10^{23}

1. Name a metal that is extracted by thermal reduction
   A Aluminium
   B Copper
   C Iron
   D Sodium

2. Oxidation can be defined as
   A The gain of electrons
   B Addition of hydrogen
   C Loss of oxygen
   D Addition of oxygen

3. Identify the change of state from solid to gas
   A Sublimation
   B Evaporation
   C Melting
   D Fusion

4. Which of the following is the main component of inactive air?
   A Argon
   B Nitrogen
   C Oxygen
   D Carbon dioxide

5. Identify a species which is an isotope of $^{35}_{17}X$
   A $^{35}_{17}X$
   B $^{35}_{18}X$
   C $^{38}_{17}X$
   D $^{36}_{18}X$

6. Explain why hydrogen gas is collected by upward delivery
   A It is heavier than air
   B It easily displaces air
   C It is lighter than air
   D Insoluble in water

7. Which of the following anions will form a precipitate with barium chloride in acid medium?
   A Sulphate ion
   B Carbonate ion
   C Sulphite ion
   D Nitrate ion

8. How many molecules are there in 4.5g of water? (RMM of water = 18)
   A 0.25×10^{23} molecules
   B 25.5×10^{23} molecules
   C 4.5×10^{23} molecules
   D 1.5×10^{23} molecules

9. Identify the gas that naturally makes rain water slightly acidic
   A Sulphur dioxide
   B Carbon dioxide
   C Hydrogen sulphide
   D Nitrogen dioxide

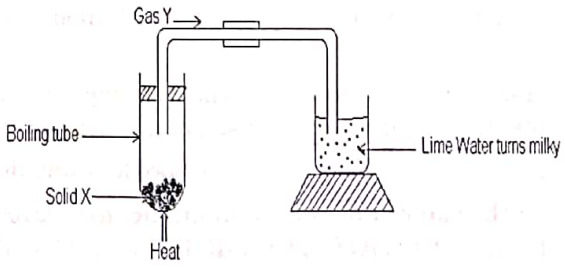
10. Select a dibasic acid from the list below
   A HCl
   B HNO_3
   C H_2SO_4
   D CH_3COOH

11. Determine the number of neutrons in an atom of $^{40}_{18}A$
   A 18 neutrons
   B 40 neutrons
   C 58 neutrons
   D 22 neutrons

12. For the reaction
$CaCO_{3(s)} + 2HCl_{(aq)} \rightarrow CaCl_{2\,(aq)} + CO_{2\,(g)} + H_2O_{(l)}$
The rate of reaction can be increased by
   A Placing the reaction mixture in an ice bath
   B Grinding the $CaCO_3$
   C Reducing the concentration of HCl
   D Increasing the pressure

13. Which of the following salts will give a brick red flame?
   A $CaCO_3$
   B Na_2CO_3
   C $BaSO_4$
   D K_2SO_4

Questions 14 and 15 concern the following diagram



14. Identify the solid S
   A Sodium carbonate
   B Sodium sulphite
   C Calcium oxide
   D Calcium carbonate

Go to the next page

15. Why does the lime water turn milky?
A Solid S is white in colour
B An insoluble salt is formed
C A white solution is formed
D A soluble salt precipitates

16. Compound X is bubbled through a solution of aqueous bromine, the reddish brown solution is decolourised. X could be
A C_2H_6
B CH_3COOH
C C_2H_5OH
D C_3H_6

17. Which of these contains the same number of particles?
A 1 mole of water and 40g of NaOH
B 1.2g of Carbon and 18g of water
C 2.4g of magnesium and 17g of ammonia
D $2400cm^3$ of O_2 and 2g of hydrogen

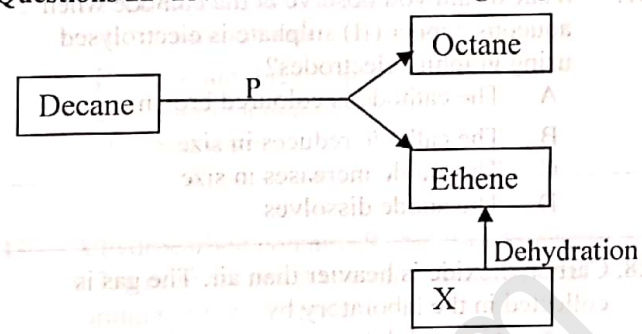
18. What is the colour change when 2 drops of phenolphthalein are added to a solution of sodium hydroxide?
A Pink to colourless
B Pink
C Colourless to pink
D Red to blue

19. Using the equation
$C_2H_{4(g)} + 3O_{2(g)} \longrightarrow 2CO_{2(g)} + 2H_2O_{(l)}$
Calculate the heat evolved when 2.8g of C_2H_4 are completely burnt $\triangle H = -1410 KJmol^{-1}$
A 2820KJ
B 3948 KJ
C 503.6 KJ
D 141KJ

20. Name the apparatus that is used in the laboratory to measure the temperature of a liquid
A Measuring cylinder
B Thermometer
C An Ammeter
D A Burner

21. The compound ammonium sulphate is commonly used as
A A fungicide
B A cleansing agent
C A fertilizer
D An antiseptic

Questions 22- 23: concern the following diagram.



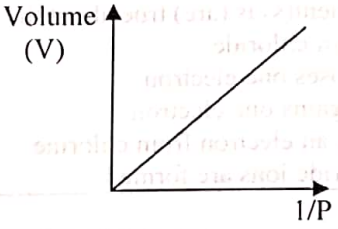
22. Identify the process, P.
A Cracking
B Distillation
C Decomposition
D Addition

23. Identify the compound X
A Ethane
B Ethyne
C Ethanoic acid
D Ethanol

24. The following reaction is used to manufacture NH_3
$N_{2\,(g)} + 3H_{2\,(g)} \rightleftharpoons 2NH_{3\,(g)}$ $\triangle$ -ve
Which of these changes would increase the yield of NH_3?
A Decreasing the pressure
B Increasing temperature
C Using a catalyst
D Increasing pressure

25. Identify a metal which is used to make kitchen utensils and also in the construction of Aircrafts
A Cu
B Al
C Ti
D Mg

26. The behaviour of some gases is represented by the following graph



Identify the law represented by the graph
A Gas law
B Charles' law
C Boyle's law
D Avogadro's law

27. What would you observe at the cathode when aqueous copper (II) sulphate is electrolysed using graphite electrodes?
A The cathode is coloured brown
B The cathode reduces in size
C The anode increases in size
D The anode dissolves

28. Carbon dioxide is heavier than air. The gas is collected in the laboratory by
A Upward delivery
B Downward delivery
C Downward displacement
D Passing over water

Questions 29- 31 Instructions

For each of the questions,
ONE or **MORE** of the response(s) given is (are) correct.
Decide which of the response(s) is (are) correct. Then choose

A. If 1, 2 and 3 are correct
B. If 1 and 3 are correct
C. If 2 and 4 are correct
D. If 4 only is correct

INSTRUCTIONS SUMMARISED

A	B	C	D
1,2,3 Only	1,3 Only	2,4 Only	4 Only

29. Which of the following equation (s) represent(s) thermal Decomposition
1. $NH_4Cl_{(s)} \longrightarrow NH_{3\,(g)} + HCl_{(g)}$
2. $Na_2CO_{3(s)} + 2HCl_{(aq)} \longrightarrow 2NaCl_{(aq)} + Cl_{2(g)} + H_2O_{(l)}$
3. $CaCO_{3(s)} \longrightarrow CaO_{(s)} + CO_{2(g)}$
4. $NaCl_{(aq)} + H_2O_{(l)} \longrightarrow Na^+_{(aq)} + Cl^-_{(aq)}$

A	
B	
C	
D	

30. Select which statement(s) is (are) true about the formation of sodium chloride
1. the sodium ion loses one electron
2. the chloride ion gains one electron
3. the sodium gains an electron from chlorine
4. sodium and chloride ions are formed

A	
B	
C	
D	

31 Which of the following industrial processes involves the use of electrolysis?
1. Electroplating
2. Manufacture of NaOH
3. Extraction of Al
4. Extraction of Cu

A	
B	
C	
D	

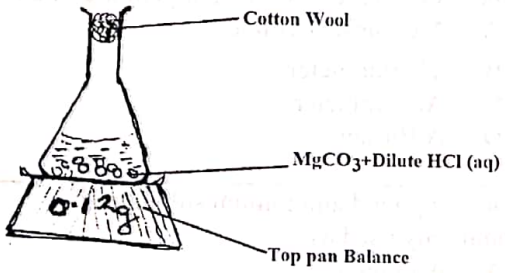
32. State one common property of metals
A They are brittle
B They are soft
C They conduct electricity
D They have more than one valency

33. A compound, X, gives a golden yellow flame. On addition of dilute hydrochloric acid to the compound, a gas is evolved that turns lime water milky. Identify the compound X
A K_2SO_3
B Na_2CO_3
C Na_2SO_4
D K_2CO_3

34. Determine the molar mass of ammonium Nitrate (NH_4NO_3)
A 66 g/mol
B 122 g/mol
C 80 g/mol
D 45g/mol

Questions 35- 36

The following setup was used to study the reaction between magnesium carbonate and dilute hydrochloric acid



35. Why is there a gradual loss in mass?
A The carbonate dissolves
B The carbonate decomposes
C Less product is formed
D CO_2 escapes

36. Why is dilute sulphuric acid not suitable for use in this experiment?
A Sulphuric acid forms an insoluble salt
B Sulphuric acid is less reactive
C Sulphuric acid is very soluble
D Sulphuric acid will oxidise the carbonate

37 Which of the following substances will form a coloured precipitate with aqueous sodium hydroxide?
A Na_2SO_4
B $CaSO_4$
C $PbSO_4$
D $CuSO_4$

38 Why is sulphur trioxide not dissolved directly in water in the manufacture of sulphuric acid?
A Sulphur trioxide is not very soluble in water
B The reaction is violent and highly exothermic
C Some of the gas will escape undissolved
D It will take a longer time for the acid to be produced

39 In an acid/ base titration, 20 cm^3 of dilute hydrochloric acid were required to neutralise 25cm^3 of 0.1M sodium carbonate solution. Determine the molarity of the dilute hydrochloric acid.
A 0.01M
B 0.13M
C 0.25M
D 2M

Questions 40 – 41
Two elements W and V have electronic configuration W=2: 8: 1 V= 2: 6

40. Write the formula of the compound formed between W and V
A W_2V
B WV
C WV_2
D WV_6

41. Write an equation for the reaction between hydrogen and V
A $2H_2 + V_2 \longrightarrow 2H_2V$
B $2H + V \longrightarrow H_2V$
C $H_2 + V_6 \longrightarrow 2HV_3$
D $H_2 + V_6 \longrightarrow H_2V_6$

42 Which of the following is a mixture?
A Common salt
B Sodium bicarbonate
C Liquid ammonia
D Sea water

43. A hydrocarbon contains 9.25g of carbon and 0.75g of hydrogen. Determine the empirical formula of the compound
A CH_2
B CH
C C_2H_2
D C_2H_4

44. Which of the following is the best procedure for diluting an acid in the laboratory?
A The water is poured into a beaker containing acid
B The water is added to a known volume of acid
C A known volume of acid is added to water
D The water is warmed then added to the acid

Questions 45-46

Instructions:

Each of the following questions consists of a statement in the left-hand column followed by a second statement in the right-hand column. Decide whether each of the statements is **TRUE OR FALSE.** Then on your answer sheet mark

A: if both statements are **true** and the second statement is a correct explanation of the first statement

B if both statements are **true** but the second statement is not a correct explanation of the first statement.

C if the first statement is **true** but the second statement is **false.**

D if the first statement is **false** but the second statement is **true.**

Instructions Summarised		
	First Statement	Second Statement
A	TRUE	TRUE and the second statement is a correct explanation of the first
B	TRUE	TRUE and the second statement is NOT a correct explanation of the first
C	TRUE	FALSE
D	FALSE	TRUE

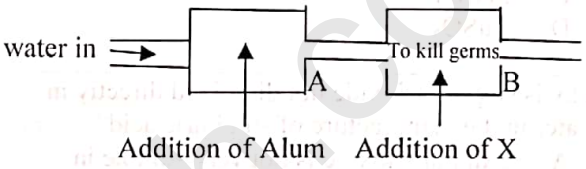
	Statement1	Statement 2
45	1mole of carbon contains 6.02×10^{23} atoms	The amount of substance in 1.2g of carbon is 0.1mol
46	Hydrogen gas is prepared by action of copper metal on dil HCl	Copper is below hydrogen on the electrochemical series

47. Which of the following organic compounds would evolve white fumes with PCl_5 ?

A	C_2H_5OH
B	CH_3OCH_3
C	CH_3COOCH_3
D	C_2H_4

Questions 48- 49

The following diagram shows some of the steps used in the purification of water for domestic use.



48 Why is alum added in tank A?

A To remove soluble impurities in water
B To coagulate tiny particles in suspension
C To remove smell and taste from water
D To increase the pressure of water into tank B

49. What is the substance used to kill germs in tank B?

A Fluorine
B Calcium hydroxide
C Chlorine
D Ammonium hydroxide

50. Identify the substance in air that supports Combustion

A Oxygen
B Nitrogen
C Argon
D Carbon dioxide

GO BACK AND CHECK YOUR WORK