**NAME …………………………….. Candidate’s Sign. ……..…**

**ADM NO. ……….. Date ………………………..**

**CHEMISTRY**

**TIME: 2 HOURS**

**MWAKICAN FORM 3 JOINT EVALUATION – 2017 TERM II**

**CHEMISTRY**

**PAPER – 233/1**

**TIME: 2 HRS**

**INSTRUCTIONS TO CANDIDATES**

1. Write your name and admission number in the spaces provided above.
2. Sign and write the date of examination in the spaces provided.
3. ANSWER ALL QUESTIONS IN THE SPACES PROVIDED.
4. All working must be clearly shown where necessary.
5. Mathematical tables or silent electronic calculators may be used.

**FOR EXAMINER’S USE ONLY**

|  |  |  |
| --- | --- | --- |
| **QUESTIONS** | **MAXIMUM SCORE** | **CANDIDATE’S SCORE** |
| 1 - 28 | 80 |  |

1.Give two reason why helium is used in weather balloons. (2mks)

2. Starting with copper metal describe how a solid sample of copper (II) carbonate can be prepared. (3mks)

3. A Hydrocarbon P was found to decolourise bromine water. On complete combustion 2 moles of P forms 6 moles of carbon(IV)oxide and 6 moles of water (3mks)

a)Write the structural formula of P.

B)Give the name of P

c)Name one industrial source of P

4.Study the information below and answer the questions that follows. The letters do not represent the actual symbols of the elements

|  |  |  |  |
| --- | --- | --- | --- |
| Element | Electrical conductivity | Ductility | Action of water  |
| A | Good | Good | No reaction |
| B | Good | Poor | No reaction |
| c | Good | Good | Reacts  |

Select an element which. (3mks)

1. Likely to be in group II of the periodic table
2. Could be used to make electric cables
3. Is likely to be graphite

5. 20cm3 of a solution containing 0.1M of sodium hydroxide was neutralized by 8.0cm3 of dilute sulphuric (VI) acid. Calculate the concentration of sulphuric (VI) acid in moles per litre(Na= 23.0, O=16.0 H= 1.0) (3mks)

a) What is a flame. (1mk)

6. State any two differences between luminous and non luminous flames. (2mks)

7. a)Why is concentrated sulphuric (VI) acid unsuitable as a drying agent for ammonia gas. (1mk)

b)Give a suitable drying agent for ammonia gas. (1mk)

8a) State and explain the change in mass that occur when Copper (II)nitrate is heated in an open crucible. (2mks)

b) Is the reaction a temporary chemical change or a permanent chemical change. (1mk)

9.Rate of diffusion of two gases A and B are in the ratio 2: 1.If the molecular mass of A is 16g. Find the molecular mass of B. (2mks)

10a)Describe how the PH of a sample of soil can be determined. (2mks)

b) State one factor that may have been responsible for the decrease in the soil PH. (1mk)

11. 1.08g of aluminum foil were heated in a stream of chlorine gas. Calculate the maximum mass of product formed if chlorine gas was in excess (Al= 27, Cl= 33.5) (3mks)

12. On a strong heating sodium nitrate liberates oxygen gas. In the space provided below draw a labelled diagram of a set-up that could be used for heating sodium nitrate and collecting of oxygen gas. (3mks)

13. Complete the table (2mks)

|  |  |  |
| --- | --- | --- |
| Species | No of neutrons | No of Electrons |
| 40C a 2+20 |  |  |

14. A fixed mass of a gas has a volume of 250cm3 at a temperature of 270c and 750mm Hg pressure. Calculate the volume the gas would occupy at 420C and 750mmHg pressure (3mks)

15. The set up below was used to prepare hydrogen gas



Complete the diagram to show how dry sample of hydrogen gas can be collected. (3mks)

16. If the atomic numbers of T and Y are 12 and 17 respectively, what type of bonding will be present in a compound formed between T and Y? Explain. (2mks)

17. Alkanes, alkenes and alkynes can be obtained from crude oil. Draw the structure of the second member of the alkyne homologous series.

b) Study the flow chart below and answer the questions that follow

 (1mk)

STEP 1

Butane

Ethene

H

1. State the condition necessary for the reaction in step I to occur. (1mk)
2. Identify substance H. (1mk)

18. Metal Q displace metals T and U from their oxides but does not displace metal R. Metal T displaces U from its oxide. Arrange the metals according to their reactivity starting with the most reactive metal. (2mks)

19. The figure shows the changes in temperature when a liquid sample was cooled.

**Temp 0C**

**P**

**Temp (mins)**

p

(i) Is the liquid sample pure or impure give a reason. (2mks)

ii)What name is given to the process that takes place at the temperature at point P

20.Name the particles responsible for conduction of electricity in (3mks)

i)Solids

ii)Molten compounds

iii)aqueous solutions

21. Diamond and graphite are both allotropes of carbon.

i) What do you understand by the term “allotropy” (1mk)

ii)Explain why graphite conducts electricity while diamond does not. (2mks)

22. The following are atomic and ionic radii of members of certain group of the periodic table. Use the information below to answer questions that follow.

|  |  |  |
| --- | --- | --- |
| Element | Atomic radius(nm)  | Ionic radius |
| W | 0.072 | 0.136 |
| X | 0.099 | 0.181 |
| Y | 0.114 | 0.195 |
| z | 0.133 | 0.216 |

The letters do not represent the actual symbols of the elements

1. Is this a group of metals or non metal Explain. (2mk)
2. Which element would you expect to be more reactive? Explain. (2mks)

23. Study the information below and answer the questions that follows. A mixture contains three solids alum, camphor and sugar. The solubility of these solids in different liquids is shown in the table below

|  |  |  |  |
| --- | --- | --- | --- |
| Solid liquid | Water | Alcohol | ether |
| Alum | Soluble | Insoluble | Insoluble |
| Camphor | Insoluble | Soluble | Very soluble |
| Sugar | soluble | Soluble | Insoluble  |

Explain how you would obtain a solid sample of sugar from the mixture. (3mks)

24. Use the scheme to answer the questions that follow.

Solid N changes from Yellow to white on cooling

Solution Q

Solution L

 H 2 SO4 (aq)

 Step II HCl (aq)

a)Identify solid N

 (1MK)

B) Write a balanced equation for the formation of Q. (1mk)

C)Name the process that takes place in step II. (1mk)

25. Determine the relative atomic mass of Neon whose isotopic compositions are (3mks)

20 21 22

(8.82%),

(0.26%),

(90.92%),

10 10 10

26. Write an equation to show the effect of heat on the nitrate of. (3mks)

i)Sodium

ii)Copper

b) Give one use of ammonium nitrate

27.a) Give the formula of compound formed between Aluminium (atomic number 13) and carbon (Atomic number 6) (1mk)

b) Explain the difference in melting point between magnesium and sodium. (2mks)

28. A clean knife is left in the open overnight and found to be coated with a reddish brown substance.

a) Name the reddish brown substance. (1mk)

b) Give one condition necessary for the brown substance to be formed. (1mk)

1. Suggest two methods that can be used to prevent the formation of the reddish brown substance. (2mk)