

NAME: INDEX NO:.....

Candidate's Signature:

Date:.....

233/1
CHEMISTRY
Paper 1
THEORY
March/April, 2011
Time: 2 ¼ Hours

MOKASA JOINT EVALUATION EXAMINATION
Kenya Certificate of Secondary Education

233/1
CHEMISTRY
Paper 1
THEORY
March/April, 2011
Time: 2 ¼ Hours

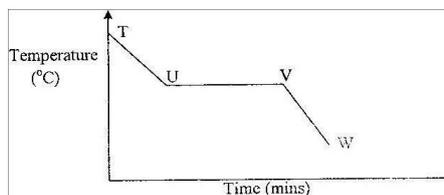
Instructions to Candidates

- Write your name and index number in the spaces provided above.
- Sign and write the date of the examination.
- Answer **all** the questions in the spaces provided in the question paper.
- All working **MUST** be clearly shown where necessary.

FOR EXAMINER'S USE ONLY

Question	Maximum Score	Candidate's Score
1 - 27	80	

1. Draw a well labeled diagram of Bunsen burner and label the major parts (3 mks)
2. Outline three specific roles of chemistry in the society (3 mks)
3. (a) Define the term sublimation (1 mk)
- (b) Give two examples of the above process other than iodine and dry ice (2 mks)
4. The sketch below shows a graph of temperature against time obtained when a gaseous substance was cooled.

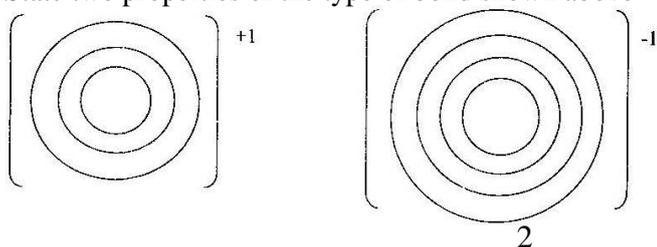


- (a) Explain what happens to the gaseous substance between: (2 mks)
 - (i) T and U
 - (ii) U and V
 - (b) What state is the substance between V and W? (1 mk)
5. Study the reaction below
- $$\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}_{(s)} \xrightarrow{\text{process}} \text{Na}_2\text{CO}_3 \cdot 1\text{H}_2\text{O}_{(s)}$$
- A B
- (a) Give the IUPAC name of compound A (1 mk)
 - (b) Give the name for process C (1 mk)
 - (c) Write an equation to show what happens when compound B is heated in a boiling tube
6. An element P has the following isotopic composition
 P – 28, 92.2%, P – 29, 4.7%, P – 30, 3.1%. The atomic number of P is 14.
- (a) Define the term isotopes (1 mk)
 - (b) Calculate the relative Atomic mass of P (2 mks)

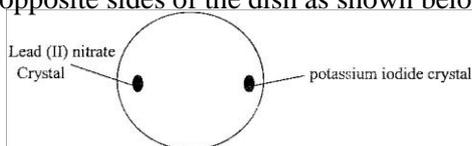
7. The table below shows ionization energy of three elements in the same group of the periodic table

Element	1 st Ionization energy kj/mole	2 nd Ionization energy kj/mole
C	900	1880
D	736	1450
E	590	1150

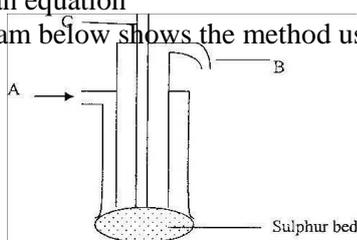
- (a) Arrange the above elements in order of their reactivity from most reactive to least reactive. (1 mk)
 - (b) Explain why 2nd ionization energy is higher than the first ionization energy (2 mks)
8. Element Y has atomic number 13 and element X has atomic number 12.
- (a) Which element among the two has the smallest atomic radius? Explain (1 ½ mks)
 - (b) Select the element that has the highest melting point. Explain (1 ½ mks)
9. Calculate the oxidation state of Cr in;
- (a) $\text{K}_2\text{Cr}_2\text{O}_7$ (1 mk)
 - (b) Using the oxidation state above, name $\text{K}_2\text{Cr}_2\text{O}_7$ (1 mk)
 - (c) Write an equation between hot lead (II) oxide and ammonia (1 mk)
10. (a) State one use of calcium sulphate (1 mk)
- (c) State two uses of aluminium element (2 mks)
11. (a) Noble gases are generally unreactive, but xenon the member of noble gases takes part in some chemical reaction. Explain why Xenon reacts in a number of reactions (1 mk)
- (b) State the reason why the noble gases are generally unreactive with exception of xenon
 - (c) State one use of the Argon (1 mk)
12. The following structures shows a type of structure in bonding
- (a) Name the structure represented by the above bonding (1 mk)
 - (b) State two properties of the type of bond shown above (2 mks)



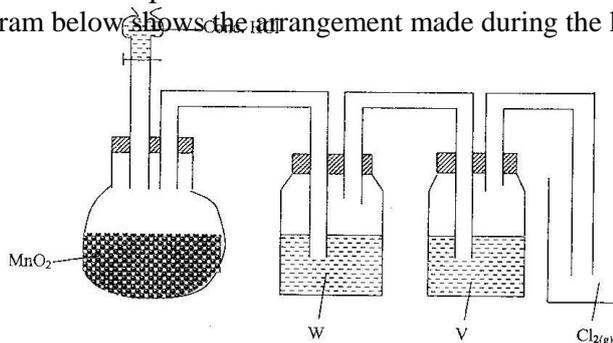
13. In 30 seconds 180cm^3 of oxygen diffused through a porous plate. How long will it take 400cm^3 of carbon (IV) oxide to diffuse through the same plate? (C= 12, O= 16) (3 mks)
14. A Petri dish was filled with water. Using forceps crystals of lead (II) nitrate and potassium iodide were placed on opposite sides of the dish as shown below



- (i) State and explain what was observed after sometime? (2 mks)
- (ii) Write an ionic equation for the reaction that took place (1 mk)
15. 20g of hydrogen selenide contains 0.494 g hydrogen and the rest selenium (se). If the compound has a molecular mass of 81, calculate its empirical and molecular formulae. (H = 1, Se= 79) (3 mks)
16. Calculate the molar masses of the following compounds (2 mks)
- (a) Iron (III) sulphate (Fe = 56, S = 32, O= 16)
- (b) Potassium permanganate (K= 39, Mn = 55, O = 16)
17. A solution containing 8g of sodium chloride is reacted with silver nitrate solution. Calculate the mass of the precipitate formed. (Na = 23, Cl = 35.5, N = 14, O = 16, Ag = 108) (3 mks)
18. In the Solvay process, write equations for the reactions that take place in: (4 mks)
- (i) The slaker
- (ii) The Solvay tower
- (iii) Give two industrial uses of sodium carbonate
19. Explain the observation made when hydrogen sulphide gas is mixed with chlorine gas that is moist and give an equation (3 mks)
20. The diagram below shows the method used during the extraction sulphur by Frasch process.



- (a) Name the substances that pass through the tubes (2 mks)
- A -
- B -
- (b) Explain how sulphur at 200 m down the soil reaches the ground surface (1 mk)
21. The diagram below shows the arrangement made during the laboratory preparation of dry chlorine gas.



- (a) Name the substance W and V (1/2 mk)
- (b) What correction should be made in the arrangement for reasonable amount of the gas to be realized? (1 mk)
- (c) What other compound could be used in place of $\text{MnO}_2(\text{s})$ (1 mk)
22. Given the equation \rightleftharpoons below:
- $$\text{NH}_3(\text{g}) + \text{H}_2\text{O}(\text{l}) \rightleftharpoons \text{NH}_4^+(\text{aq}) + \text{OH}^-(\text{aq})$$
- (a) Identify the acid in the forward reaction (1 mk)
- (b) If the reaction above is at equilibrium, explain the effect of adding more water (2 mks)
23. Potassium nitrate dissolve in water according to the equation below



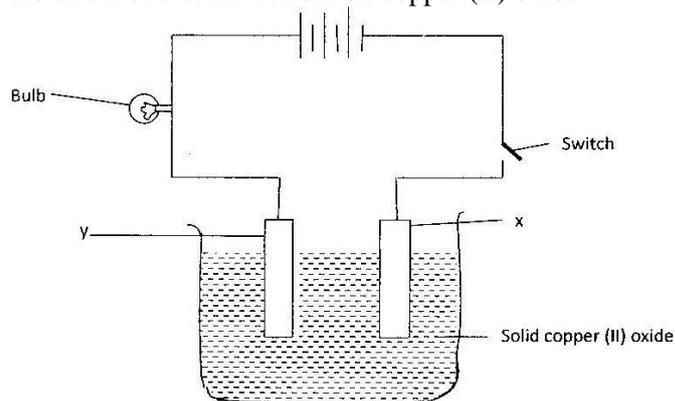
- (a) Represent the reaction above on an energy level diagram (2 mks)
 (b) What would be the effect on the solubility of $\text{KNO}_{3(s)}$ when the temperature is increased. (1mk)

24. Use the information given below to answer the questions that follow:



- (a) Calculate the E° value of the cell obtained if the two half cells are connected (2 mks)
 (b) Explain if it is possible for the solution of metal G to be kept in a container made up of $\text{J}_{(s)}$ (2 mks)

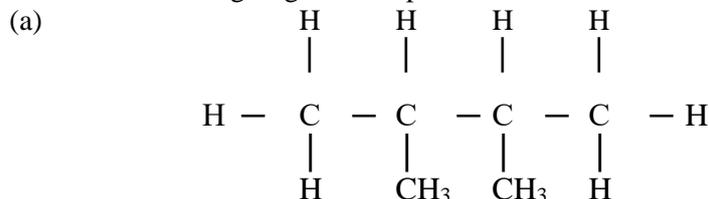
25. The set up of a beaker below was made by a form 2 student at Mali ya Moto High school to investigate the effect of electric current on copper (II) oxide



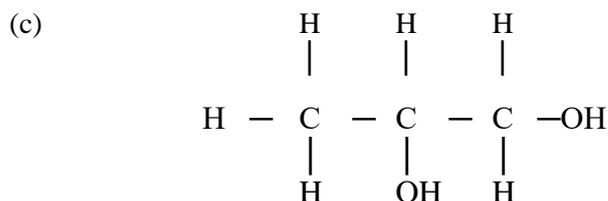
- (a) The bulb could not glow when the switch closed. Explain? (1 mk)
 (b) The student then corrected the mistake and after some time there was a chemical reaction which occurred at the electrodes x and y and y causing the bulb to light when the circuit was completed. Write the chemical equation that represent what happened at the electrodes at (2 mks)

x -
y -

26. Name the following organic compounds (3 mks)



(b) $\text{CH}_3\text{CH}_2\text{COOCH}_2\text{CH}_3$



27. How can the pollution caused by polythene materials be prevented (2 mks)