NAME..... ADM NO.....

SCHOOL..... CANDIDATES SIGN.....

DATE .....

233/1
CHEMISTRY
FORM 3
TIME: 2 HOURS

END OF TERM (III) EXAMINATION -2019

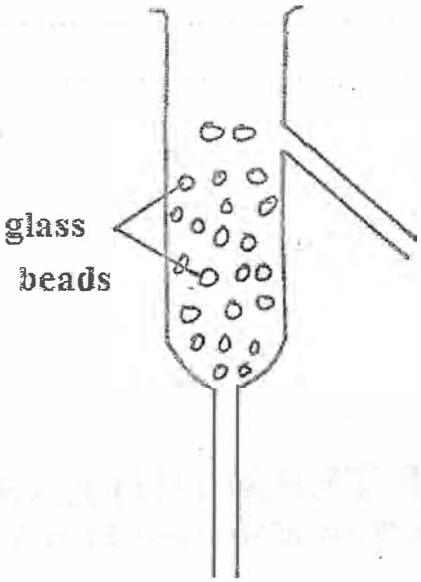
Kenya Certificate of Secondary Education (K.C.S.E)

233/1
CHEMISTRY
FORM 3
TIME: 2 HOURS

FOR EXAMINERS USE ONLY

Question	Maximum score	Candidates score
1-28	80	

1. a) Name and state the specific function of the piece of apparatus drawn below



Name---------- (1 mk)

Function ---------- (1 mk)

b) State one other substance that can be used in place of the glass beads (1mk)

.....

.....

2. i) In an experiment, a deflated basketball was weighed and its mass recorded as 200g. Air was then pumped into it, and the mass and size increased.

What is the purpose of the experiment with respect to :-

a) Increase in mass ($^1/_2$ mk)

.....

.....

b) Increase in size ($^1/_2$ mk)

.....

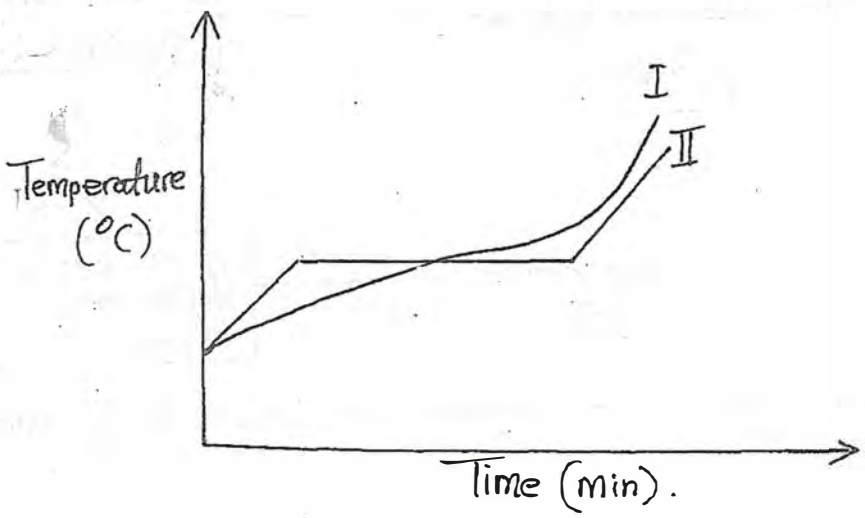
.....

ii) State and explain the observation made if the ball was placed in ice-cold water (2 mks)

.....

.....

3. The illustrations below shows curves obtained by a student after heating two solids separately to determine their purity



a) Which curve represents a pure substance? Explain (2 mks)

.....

.....

.....

.....

b) What physical property of the substance was used to determine their purities? (1 mk)

.....

.....

c) Give one practical application of the above experiment (1 mk)

.....

.....

4. Kamau was sting by a bee while on his way home form the market. He applied wood ash solution to relieve the pain. Explain (2 mks)

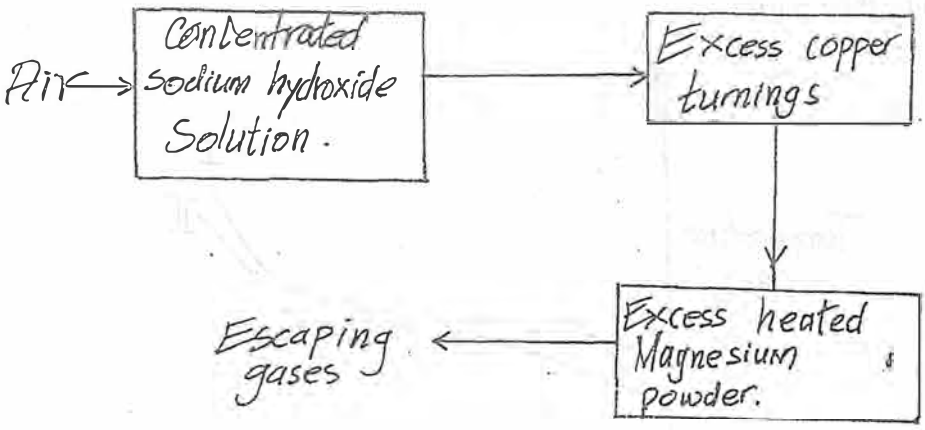
.....

.....

.....

.....

5. Air was passed through several reagents as shown below.



a) Write an equation for the reaction which takes place in the chamber containing magnesium powder. (1 mks)

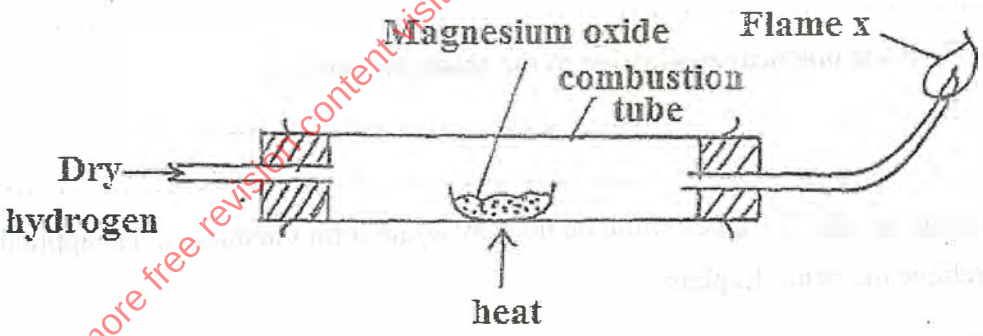
.....

b) Name one gas which escapes form the chamber containing magnesium powder.
Give a reason for your answer (2 n)

.....

.....

6. The diagram below illustrates an experiment where dry hydrogen gas is passed over heated magnesium oxide.



a) State the observation that is made inside the combustion tube. (1 mk)

.....

b) Explain the observation in (a) above (1 mk)

.....

.....

c) Write an equation for the formation of flame X (1 mk)

.....

.....

7. Two elements A and B have electronic configuration 2,8,3 and 2,6 respectively

a) To which group and period does element B belong? (1 mk)

.....

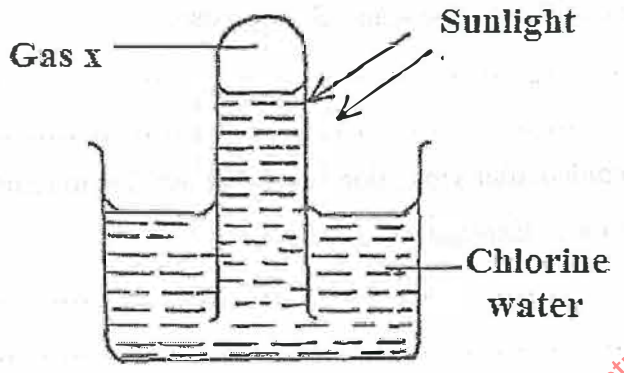
.....

b) If the two react, what is the formula of the compound they form (1 mk)

.....

.....

8. The set-up below was left exposed in direct sunlight by a student for several hours.



a) Name gas X (1mk)

.....

.....

b) State the observation that is made when green leaves are put into the solution after the exposure. (1 mk)

.....

.....

9. A student put lead (ii) carbonate and lead (ii) nitrate in separate test-tubes and performed the tests as shown in the table below. Complete the table by giving the expected observations.

Salt	Adding water	Heating
Lead (ii) carbonate		
Lead (ii) nitrate		

(2 mks)

10. a) State the Graham's Law diffusion. (1 mk)

.....

.....

b) 48cm^3 of an oxide of Nitrogen diffused through a porous plug. At the same time, it took 159 cm^3 of helium to diffuse through the same plug under similar conditions. Determine the molecular mass of the oxide (He = 4, N = 14) (2 mks)

.....

.....

.....

.....

11. Kenya is now among the countries producing crude oil from Ngamia 8

i) Name the method used to separate the components of cruide oil. (1 mk)

.....

.....

ii) Bitumen is one of the components. State its use. (1 mk)

.....

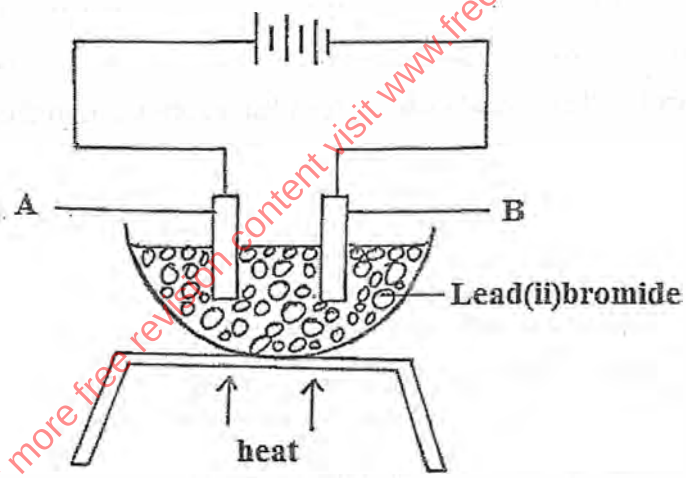
.....

iii) The diesel obtained after separation should be purified to remove sulphur and then sold as low sulphur diesel. Explain (1 mk)

.....

.....

12. Below is a set-up of apparatus used to investigate the effect of an electric current on molten lead (ii) bromide



a) Name the electrode A. (1 mk)

.....

.....

b) Show the direction of flow of electrons on the diagram (1 mk)

.....

.....

c) Write an equation for the reaction taking place at electrode B. (1mk)

.....

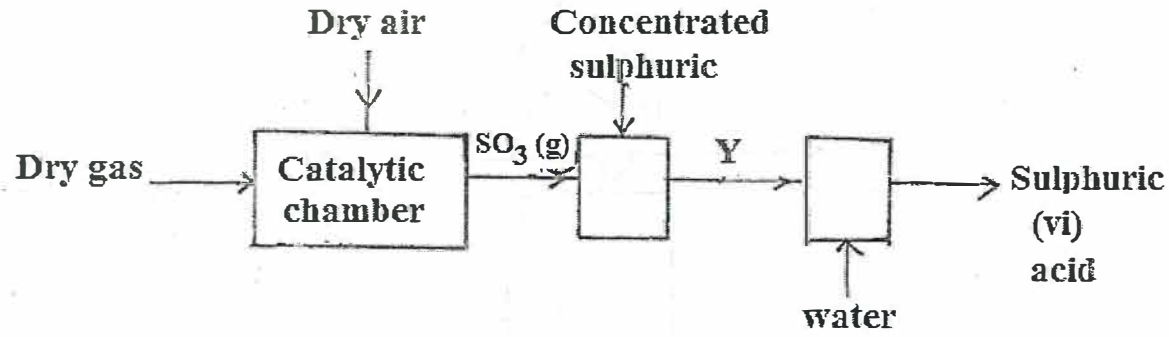
.....

d) Mention one application of the above process. (1 mk)

.....

.....

13. The flow chart below shows part of a process for manufacture of sulphuric (vi) acid.



a) Identify

i) X (1 mk)

.....

.....

ii) Y (1 mk)

.....

.....

b) Name the catalyst used in the catalytic chamber. (1 mk)

.....

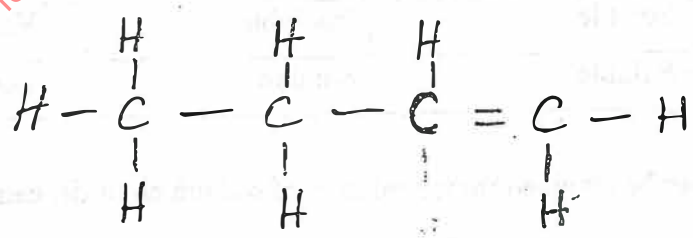
.....

c) Explain why sulphur (vi) oxide is first dissolved in concentrated sulphuric (vi) acid and not in water (1 mk)

.....

.....

14. a) Name the compound whose structure is given below



.....(1mk)

.....

b) Name two reagents that can be used to distinguish between alkanes and alkenes. (1 mk)

.....

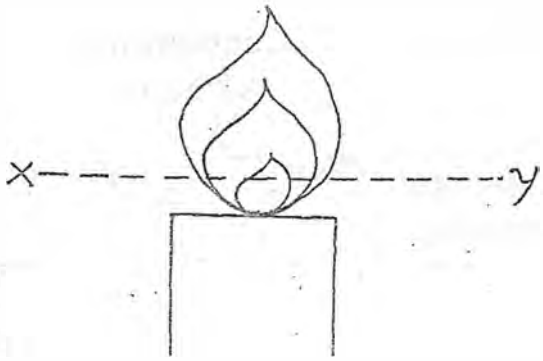
.....

c) State two uses of polyethene (1 mk)

.....

.....

15. Below is a diagram of a Bunsen burner.



a) Identify the type of flame (1mk)

.....

.....

b) Under what conditions is it produced? (1 mk)

.....

.....

c) A splint is placed across point XY for some few seconds and then removed before its burned.

Draw and label the splint to show the observation made (1 mk)

.....

.....

16. A mixture contains sodium chloride, sugar and camphor. The table below shows the solubility of those solids in different liquids

Solid/Liquid	Water	Ethanol	Ether
Sodium chloride	Soluble	Insoluble	Insoluble
Camphor	Soluble	Insoluble	Very soluble
Sugar	Soluble	Soluble	Insoluble

Explain how sugar can be obtained from a mixture of sodium chloride, camphor and sugar.

(3 mks)

.....

.....

.....

.....

.....

.....

17. The information below gives PH values of solution V,W,X and Z

Solution	PH values
V	2
W	6.5
X	11
Y	14
Z	4.5

a) Which solution is likely to be :

i) Calcium hydroxide? (1 mk)

.....

.....

ii) Rain water? (1mk)

.....

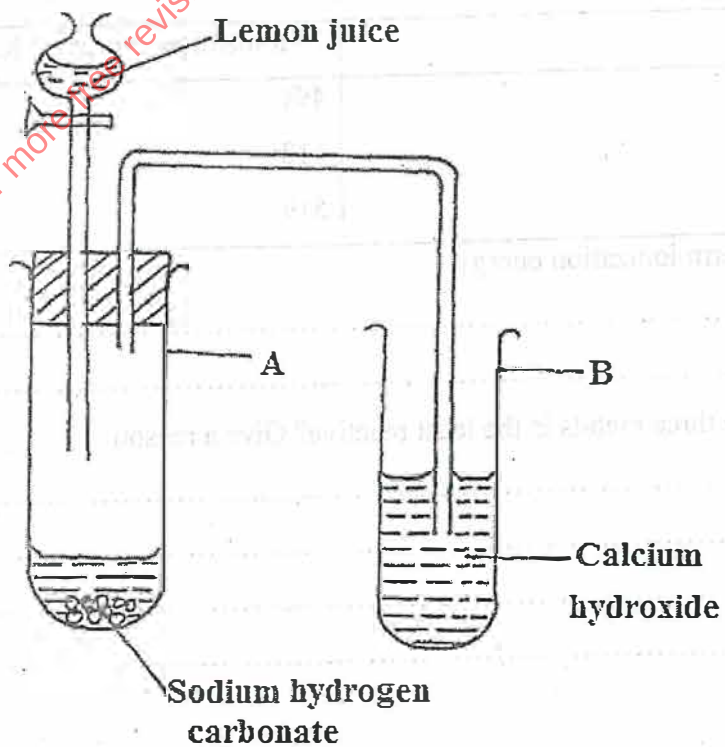
.....

iii) Which solution would react most vigorously with zinc carbonate? (1 mk)

.....

.....

18. The diagram below shows apparatus used to react lemon juice and sodium hydrogen carbonate. Study it and answer the questions that follow.



a) State and explain observation made in each boiling tube. (2 mks)

.....

.....

.....

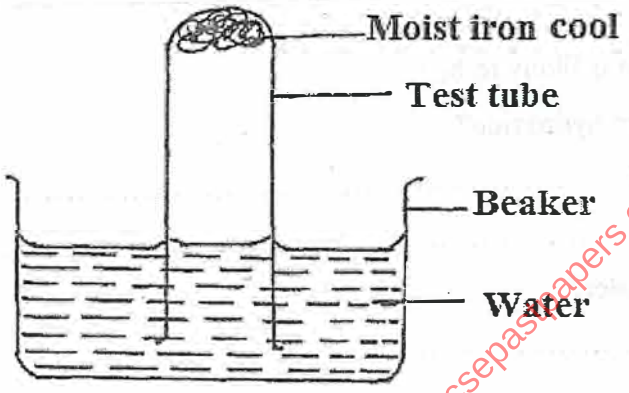
.....

b) How is the PH of acidic soil affected by addition of calcium oxide. (1 mk)

.....

.....

19. The set up below was used to study some properties of air.



State and explain two observations that would be made at the end of the experiment. (2 mks)

.....

.....

.....

.....

20. The table below gives the first ionization energies of the alkali metals

Element	1st Ionization energy in KJ Moi-1
A	494
B	418
C	519

a) Define the term ionization energy (1mk)

.....

.....

b) Which of the three metals is the least reactive? Give a reason (2 mks)

.....

.....

.....

.....

21. Starting with lead (ii) carbonate explain how you would prepare a pure sample of lead (ii) sulphate. (3 mks)

.....

.....

.....

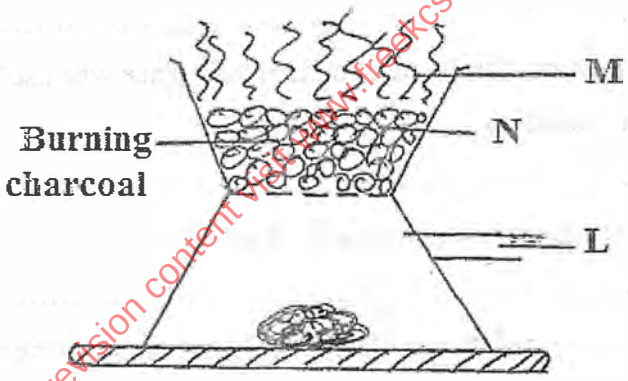
.....

22. Using dots (.) and crosses (x), draw a diagram showing bonding in :

i) Hydroxonium ion H_3O^+ (H = 1, 0 = 8) (1 mk)

ii) Sodium Oxide (Na = 11, 0 = 8) (1 mk)

23. The diagram below represents a burner (Jiko) with burning charcoal.



a) i) State two products formed in regions

M and N

M _____ (1 mk)

N _____ (1 mk)

ii) What is the function of the part labeled L. (1 mk)

.....

b) Why should people be discouraged from using charcoal in Kenya? (1 mk)

.....

24. Sodium carbonate dehydrate, $Na_2CO_3.10H_2O$, were left exposed in the atmosphere on a watch glass for two days.

a) State the observation made on the crystals after two days (1 mk)

.....

b) Name the property of salts investigated in the above experiment. (1 mk)

.....

25. State and explain what happens When solid Na_2CO_3 is put into a solution of aluminum chloride (3 mks)

.....

.....

.....

26. Describe how one can prepare one litre of 0.5 Magnesium nitrate solution.
(Mg = 24.0, N = 14.0, O = 16.0) (3 mks)

.....

.....

.....

27. Colored flowers placed in a gas jar containing gas X immediately turned white. A solution of gas X formed a white precipitate with silver nitrate solutions. The precipitate was insoluble is nitric (V) acid but dissolves in excess ammonia solution.

a) Identify Gas X. (1mk)

.....

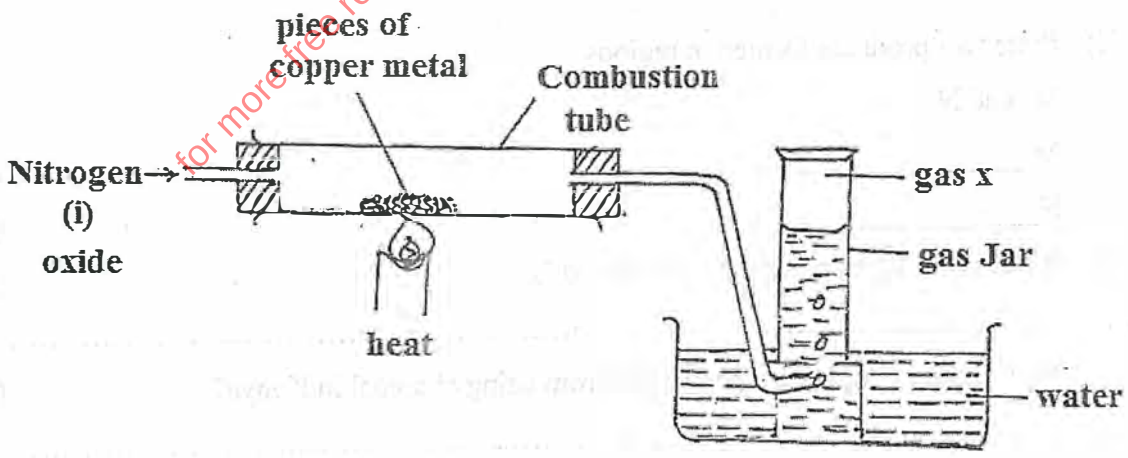
b) Write the equation for the reaction that took place when solution of Gas X reacted with silver nitrate solution (1 mk)

.....

c) Gas X is used in treatment of water. Explain (1 mk)

.....

28. The set-up shows how small pieces of copper are heated in Nitrogen (I) Oxide.



a) Write an equation for the reaction which occurs in the combustion tube. (1 mk)

.....

b) Give one use of Nitrogen (I) oxide (1 mk)

.....