NAME: ……..……..

SCHOOL:……

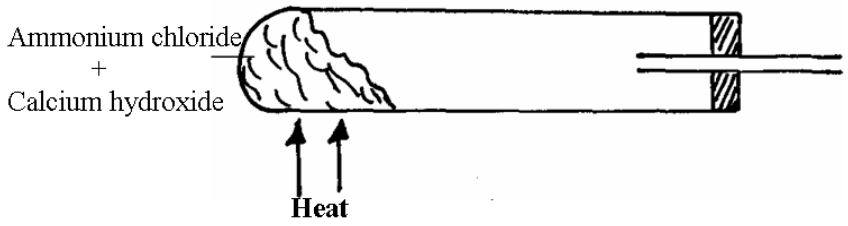
DATE: .....

NITROGEN AND ITS COMPOUNDS

INSTRUCTIONS TO CANDIDATES

*Answer **ALL** questions in this paper in the spaces provided.*

1. Complete the diagram to show how a sample of dry ammonia gas can be prepared in the laboratory. (3mks)



2. In an experiment to study the properties of concentrated nitric acid, a mixture of the acid and wood charcoal was heated in a boiling tube.

   (a) What observations were made? Explain your answer (2mks)

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(b) Write an equation for the reaction that took place in the boiling tube (1mk)

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3. Magnesium was burnt in air forming a white residue T. When put in a boiling tube with water effervescence was noticed and colourless gas D with a characteristic pungent smell was evolved. The gas turned a wet red litmus paper blue.

(a) Identify

(i) Residue **T** (1mark)

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(ii) Gas D (1mark)

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(b) **Write** an equation for liberation of gas D. (1mark)

4.(a) **Using** the oxidation state of nitrogen state the change in copper and nitric (v) acid reaction below. (2marks)

$$3Cu_{(s)} + 8HNO_{3(aq)} \longrightarrow 3Cu(NO_3)_{2(aq)} + 4H_2O_{(l)} + NO_{(g)}$$

(a) **State** the observations made during the experiment in (a) above. (1mark)

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5.Three nitrates Q,R, and S were each heated and the products formed were tabulated as shown below.

Nitrate	**Products**
Q	Metal Nitrite + Oxygen
R	Metal + Nitrogen IV Oxide + Oxygen
S	Nitrogen I Oxide + water

a) Identify

S …… (1mk)

R ……..(1mk)

b) What is the name given to elements in the same group as Q? (1mk)

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6. a) Explain why a solution of concentrated nitric acid in a reagent bottle is yellow whereas pure concentrated nitric acid is colourless. (1mk)

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b) Explain the observations made when acidified iron II chloride solution is warmed with concentrated nitric acid. (2mks)

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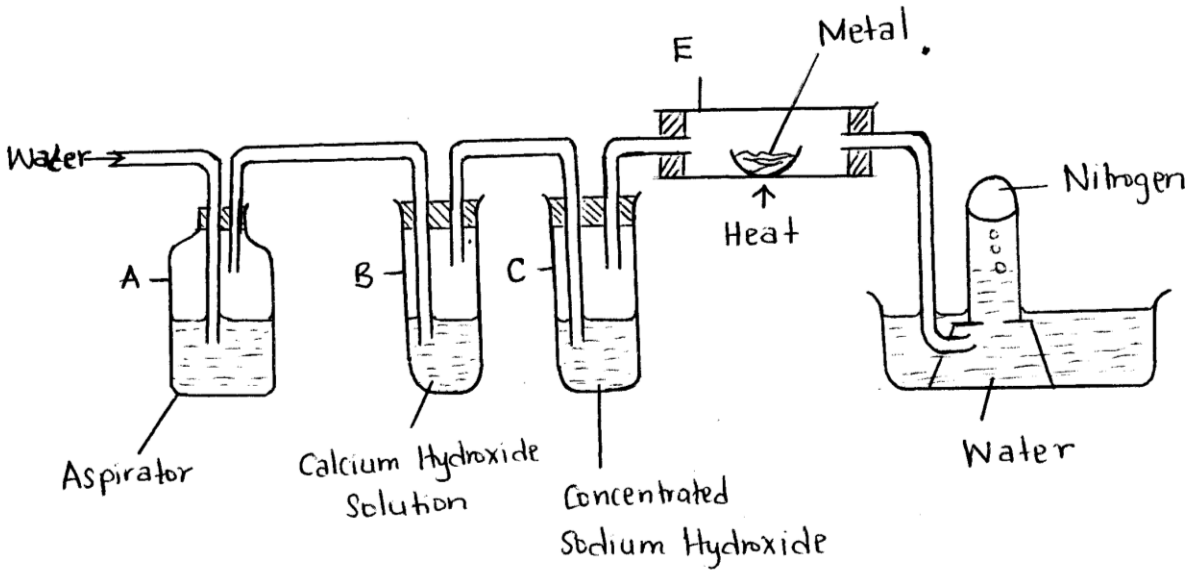
7. The diagram below shows the set up for the extraction of nitrogen gas from air.



(a) **Explain** why it is not advisable to collect the first few bubbles of the gas. (½ mk)

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(b) **Explain** the change that occurs in Calcium Hydroxide solution using a chemical equation. (1mk)

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(c) **What** is the purpose of concentrated Sodium Hydroxide? (½ mk)

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(d) **State** the observation made in apparatus E. (1mk)

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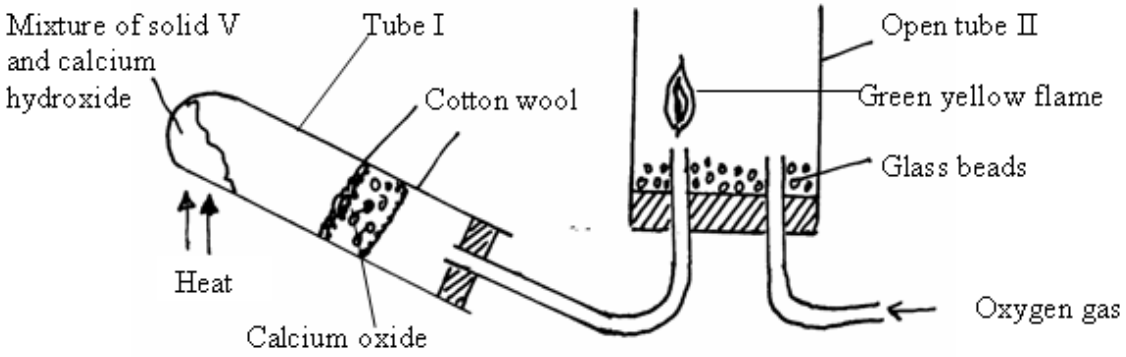
8. The set up below was used to prepare ammonia gas and investigate its property.



a) Identify solid V. (½ mk)

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b) What is the role of calcium oxide. (½ mk)

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c) Write a balanced equation for the reaction that occurs as ammonia gas burns to give greenish yellow gas. (1mk)

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d) The flame in the above set up was put off then a coiled hot platinum wire was introduced into tube II. Write a balanced equation for the reaction that took place. (1mk)

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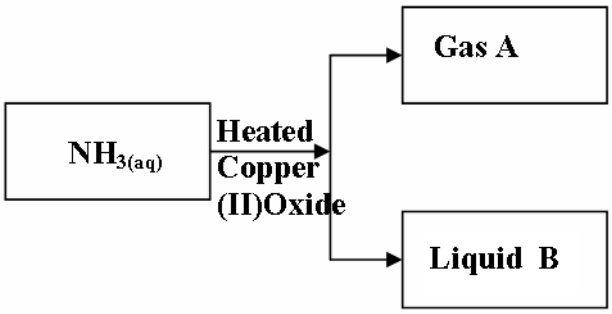
9. Study the flow chart below and answer the questions that follow.



(a) State the observation made when ammonia gas is passed over heated copper (II) oxide. (1mk)

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(b) Identify:

(i) Gas A (1mk)

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(ii) Liquid B (1mk)

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