**H/W 3.2 – Fertilisers**

**PART A**

1. The grid shows different elements.

|  |  |  |
| --- | --- | --- |
| **A.** Oxygen | **B.** Carbon | **C.** Nitrogen |
| **D.** Phosphorus | **E.** Hydrogen | **F.** Calcium |

1. Identify the two elements that are present in fertilisers.
2. Identify the two elements which combine in the air during lightening storms. (2 marks)

2. The grid shows different pairs of compounds.

|  |  |  |
| --- | --- | --- |
| **A.** Ammonium nitrate  Potassium hydroxide | **B.** Calcium oxide  Nitric acid | **C.** Potassium nitrate  Sulphuric acid |
| **D.** Ammonium chloride  Nitric acid | **E.** Hydrochloric acid    Sodium hydroxide | **F.** Ammonium sulphate  Calcium oxide |

Identify the two pairs which react in a neutralisation process. (1 mark)

3. Jim was asked to find out whether fertilisers containing potassium ions, K+, or fertilisers containing ammonium ions, NH4+, are better for growing lettuces. He made up two fertiliser solutions for his experiment.

Identify the **two** solutions which Jim could have used in a fair test.

|  |  |  |
| --- | --- | --- |
| **A.** KNO3  concentration 1 mol/l | **B.** K2S04  concentration 1 mol/l | **C.** K2S04  concentration 2 mol/l |
| **D.** NH4Cl  concentration 2 mol/l | **E.** (NH4)2S04  concentration 1 mol/l | **F.** NH4NO3  concentration 2 mol/l |

(1 mark)

4. The salts formed by nitric acid are called

A. Chlorides

B. Ethanoates

C. Nitrates

D. Sulphates (1 mark)

5. Fertilisers help plants to grow by providing them with:

A. Water

B. Oxygen

C. Nutrients

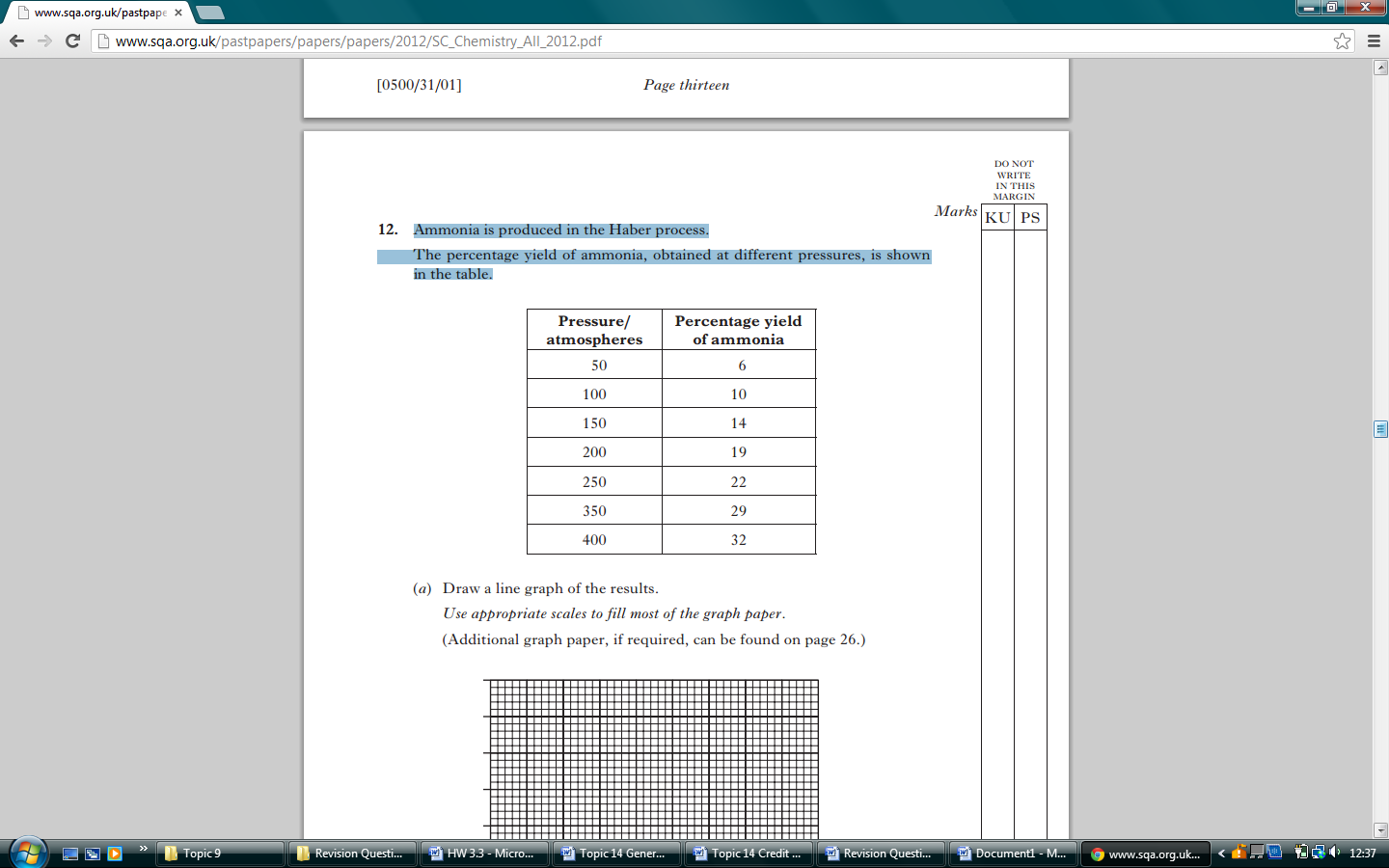
D. Carbon dioxide (1 mark)

**PART B**

4. a) Why are fertilisers added to the soil?

b) Give one example of environmental problems that can be caused by the use of artificial fertilisers. (2 marks)

5. Ammonia is produced in the Haber process. The percentage yield of ammonia, obtained at different pressures, is shown in the table.



1. Draw a line graph of the results.
2. Using your graph, estimate the yield of ammonia at 300 atmospheres. (3 marks)

6. Calculate the percentage of essential elements in the following compounds.

1. Potassium phosphate
2. Ammonium phosphate (4 marks)

TOTAL = 15 Marks