Section A

Answer **all** questions in the spaces provided.

1 White phosphorus (P_4) is a hazardous form of the element. It is stored under water.

1 (a) Suggest why white phosphorus is stored under water.

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(1 mark)

1 (b) Phosphorus(V) oxide is known as phosphorus pentoxide.
Suggest why it is usually represented by P_4O_{10} rather than by P_2O_5

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(1 mark)

1 (c) Explain why phosphorus(V) oxide has a higher melting point than sulfur(VI) oxide.

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(2 marks)

1 (d) Write an equation for the reaction of P_4O_{10} with water to form phosphoric(V) acid.
Give the approximate pH of the final solution.

Equation .....

pH .....

(2 marks)

1 (e) A waste-water tank was contaminated by P_4O_{10}. The resulting phosphoric(V) acid solution was neutralised using an excess of magnesium oxide. The mixture produced was then disposed of in a lake.

1 (e) (i) Write an equation for the reaction between phosphoric(V) acid and magnesium oxide.

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(1 mark)

1 (e) (ii) Explain why an excess of magnesium oxide can be used for this neutralisation.

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(1 mark)

1 (e) (iii) Explain why the use of an excess of sodium hydroxide to neutralise the phosphoric(V) acid solution might lead to environmental problems in the lake.

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(1 mark)

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Turn over for the next question