

Paper 3 Section B (20 marks)

Answer any **two** questions in this section.
Write your answer in the spaces provided.

- 7 (a) (i) Name an element from Period 3 and explain how the electronic structure of this element can be used to determine the group the element belongs.

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- (ii) Moving from Group I to Group VII across period 3, the character of the elements change.

Describe and explain this change.

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- (b) The element with an atomic number of 87 is extremely rare and only about 30 g exist throughout the Earth crust.

Predict one physical and one chemical property of this element.
Write a balanced chemical equation, with state symbols, to represent the chemical property that you have described.

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8 Coal contains sulfur. When coal is burnt at power stations in an excess of oxygen, sulfur dioxide is formed according to the reaction shown below.



(a) (i) Explain why sulfur is considered to be oxidised in this reaction.

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(ii) Find the mass of sulfur burnt if 320 dm³ of sulfur dioxide is formed at room temperature and pressure.

[3]

(iii) Describe how the release of sulfur dioxide can indirectly cause damage to buildings made of limestone.

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(b) Two pollutants can be produced in the internal combustion engines of automobiles.

Name the pollutants and describe how they are produced in the engines of automobiles.

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