



CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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8291/13

October/November 2022

1 hour 45 minutes

You must answer on the question paper.

No additional materials are needed.

- Section A: answer **all** questions.
- Section B: answer **one** question.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

- The total mark for this paper is 80.
- The number of marks for each question or part question is shown in brackets [].

This document has **20** pages. Any blank pages are indicated.

Section A

Answer **all** questions in this section.

- 1** In 2020 scientists confirmed the discovery of a new species of orangutan. The Tapanuli orangutan is found in a small area of rainforest on the Indonesian island Sumatra. The species is critically endangered. It is threatened by road construction, illegal forest clearance and a proposed hydroelectric dam.

- (a)** Describe the short-term and the long-term environmental impacts of a hydroelectric dam.

short-term

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.....

.....

long-term

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.....

[4]

- (b)** Describe the economic impacts of a hydroelectric dam on the local and national population of Indonesia.

local

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national

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[4]

- (c) Explain how the Evolutionarily Distinct and Globally Endangered (EDGE) programme can help conserve the Tapanuli orangutan.

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..... [2]

- (d) Outline **two** relevant strategies, other than the EDGE programme, for the conservation of the Tapanuli orangutan.

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..... [4]

[Total: 14]

- 2 Fig. 2.1 shows the formation of dry and wet acid deposition.

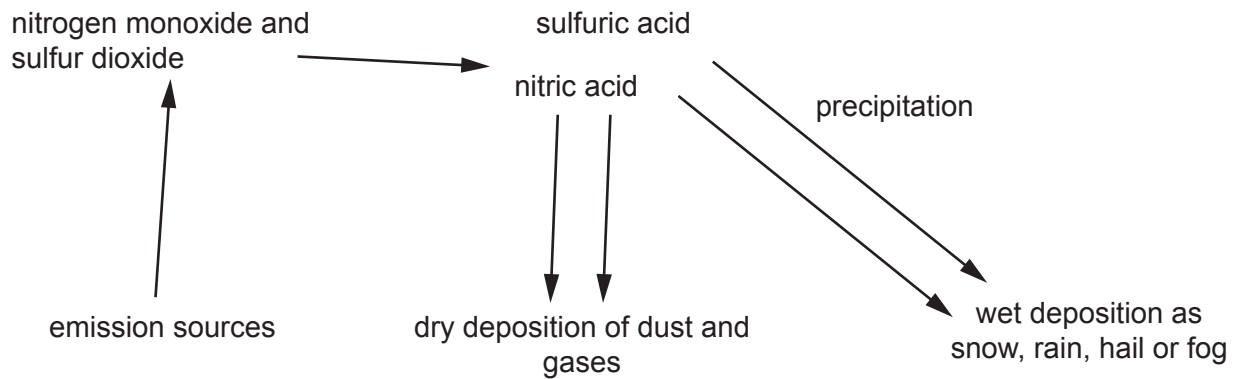


Fig. 2.1

- (a) State **one** emission source that can lead to the acid deposition shown in Fig. 2.1.

.....
 [1]

- (b) Outline the formation of wet acid deposition shown in Fig. 2.1.

.....

 [2]

- (c) Outline the impact of acid deposition on vegetation and crops.

.....

 [2]

- (d) Suggest **two** management strategies to reduce the formation of acid deposition.

.....

 [2]

[Total: 7]

- 3 (a) Fig. 3.1 shows data from a report on the number of undernourished people in the world in 2018.

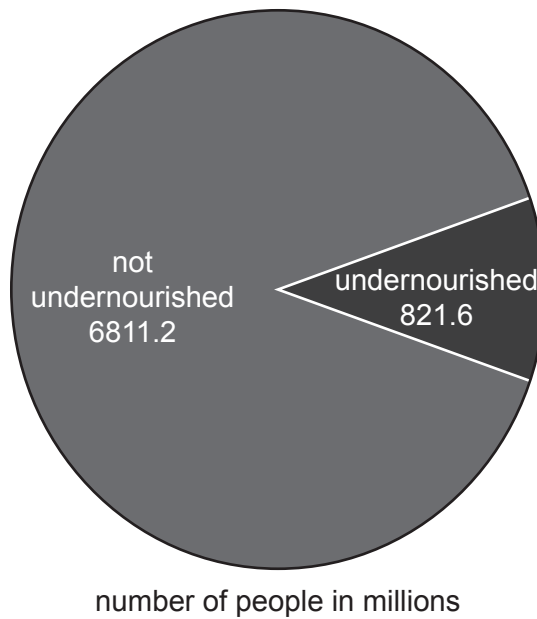


Fig. 3.1

- (i) Use Fig. 3.1 to calculate the percentage of the world's population who are undernourished.

..... [2]

- (ii) Food insecurity can cause undernourishment.

Define food security.

.....

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.....

..... [2]

(iii) Explain **two** causes of food insecurity.

1

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.....

.....

2

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.....

.....

[4]

(b) Africa Rising is a project which helps local people. It offers specific solutions and advice on sustainable agricultural methods. These solutions aim to improve household welfare.

It focuses on crops and livestock as well as the use of trees in agriculture, irrigation, soil conservation and nutrition.

The project works with women and men.

Explain how the Africa Rising project can improve food security.

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..... [3]

[Total: 11]

- 4 Aquifers, artesian wells and boreholes are strategies for managing water security.

(a) Complete Table 4.1 by matching the strategies to the correct definition.

aquifer artesian well borehole

Table 4.1

definition	strategy
a deep narrow hole made in the ground to locate ground water	
a body of permeable rock which can contain or transmit ground water	
a deep hole through permeable rock which reaches ground water held under pressure	

[2]

(b) State **one** source of ground water.

.....
 [1]

(c) Describe how ground water stores can become polluted.

.....

 [2]

(d) Explain how the pollution of ground water stores can lead to water insecurity.

.....

 [3]

(e) Explain **one** strategy to manage water security.

.....

 [2]

[Total: 10]

[Turn over

5 (a) Fig. 5.1 shows a food web for the Southern Ocean.

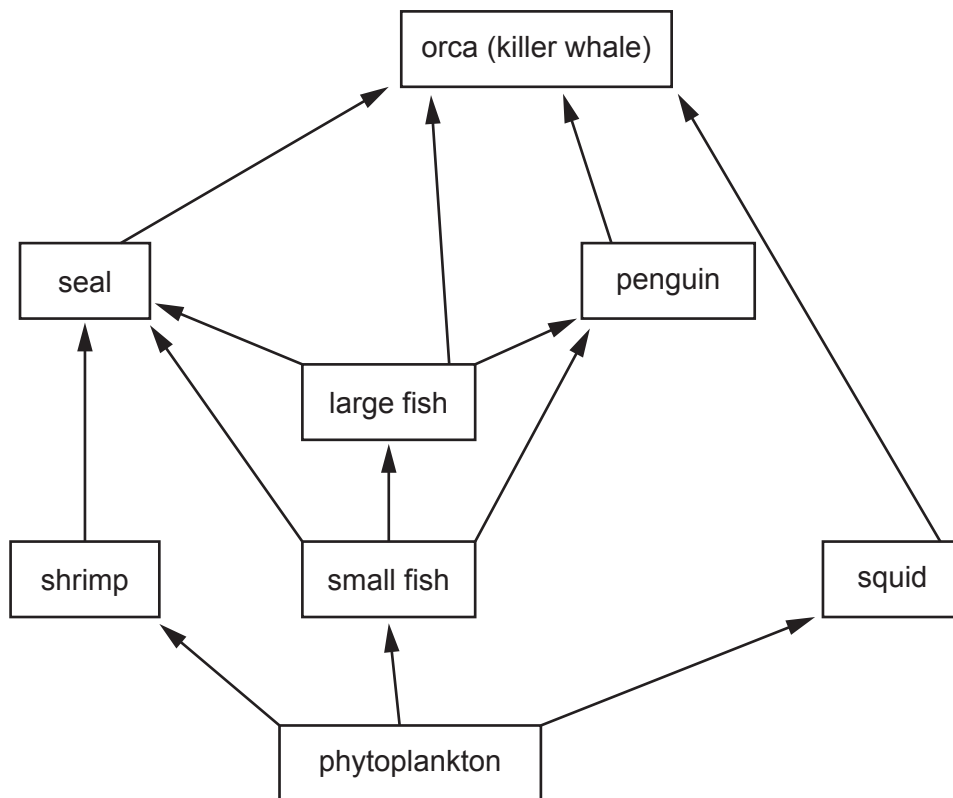


Fig. 5.1

(i) State what the arrows in the food web shown in Fig. 5.1 represent.

..... [1]

(ii) State the trophic level of large fish.

..... [1]

(iii) State the trophic level with the least energy available.

..... [1]

(iv) Explain how energy is lost from a food web.

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..... [2]

- (v) Explain the effects a decrease in the squid population would have on this Southern Ocean food web.

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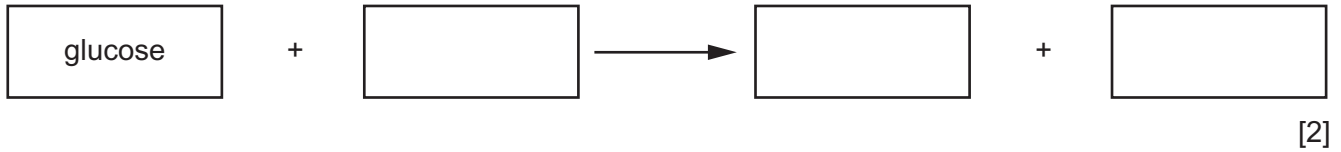
.....

.....

..... [4]

(b) Aerobic respiration is a process in which energy is released from glucose.

(i) Complete the word equation for aerobic respiration.



(ii) Fig. 5.2 shows a simplified diagram of the carbon cycle.

Use the following terms to complete the diagram in Fig. 5.2.

photosynthesis respiration feeding decomposition combustion

You may use each term more than once.

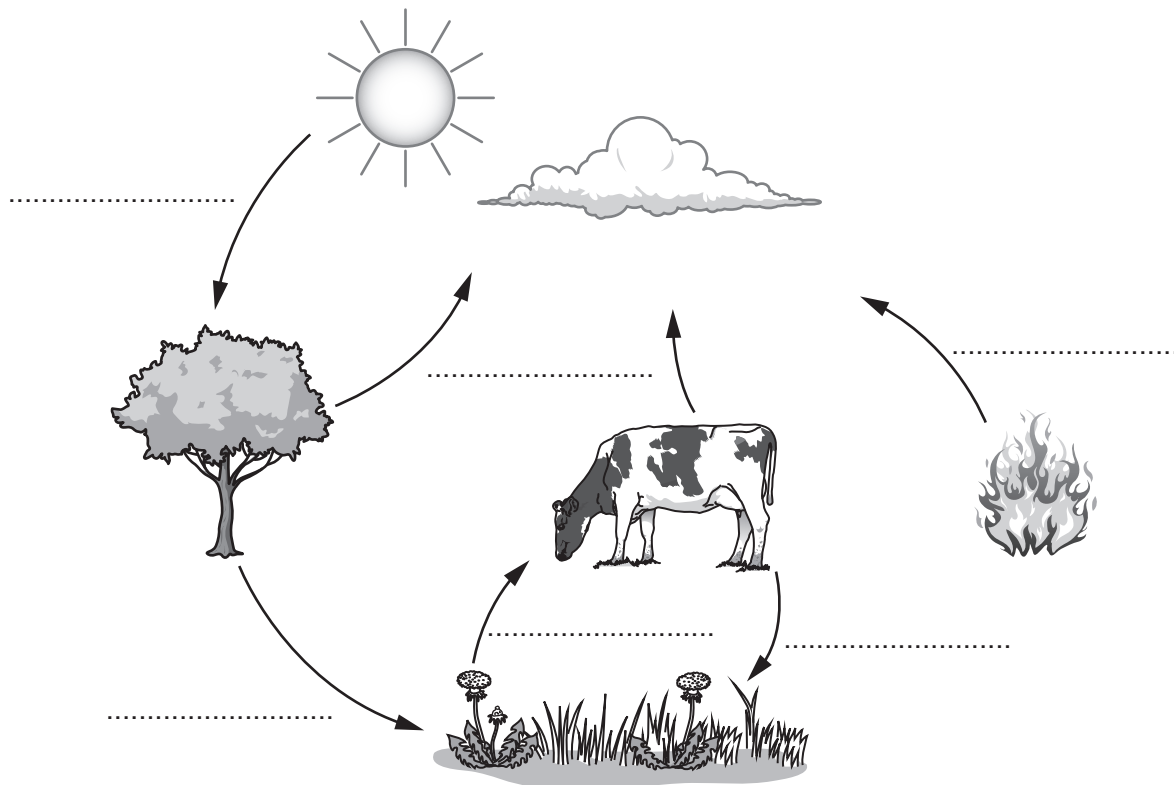


Fig. 5.2

[3]

- (iii) Explain how the combustion of fossil fuels leads to climate change.

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..... [4]

[Total: 18]

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