Organisms and their environment – 2023 November IGCSE 0610

1. Nov/2023 /Paper_ 0610/11/No.36

Which process decreases the amount of carbon dioxide in the atmosphere?

A combustion

B decomposition

C photosynthesis

D respiration

2. Nov/2023 /Paper_ 0610/11/No.37

It is estimated that 90% of the energy which flows through living organisms in a food chain is lost between one trophic level and the next.

The producers in a food chain contain 1000 units of energy.

How many units will reach the quaternary consumers in the food chain?

A 0.1 units

B 1 unit

C 10 units

D 100 units

3. Nov/2023 /Paper_ 0610/13/No.28

What is an example of a population?

A all the animals and plants living in a lake

B all the different herbivores in a forest

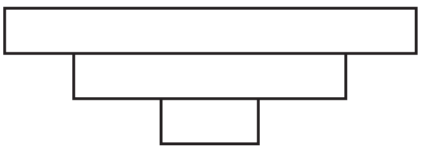
C all the mahogany trees growing in a forest

D all the species of animals in Africa

4. Nov/2023 /Paper_ 0610/13/No.36

The diagrams show pyramids of numbers and biomass.

1



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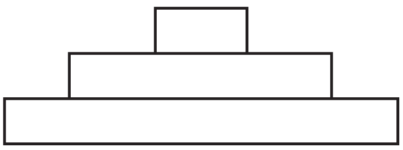

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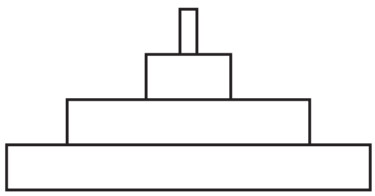

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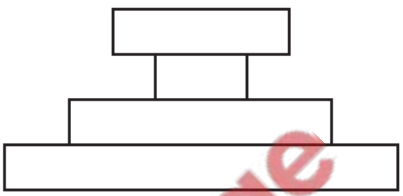


Which pyramids could be pyramids of biomass?

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

5. Nov/2023 /Paper_ 0610/13/No.37

Which process transfers energy between the first and second trophic levels of a food chain?

A egestion

B ingestion

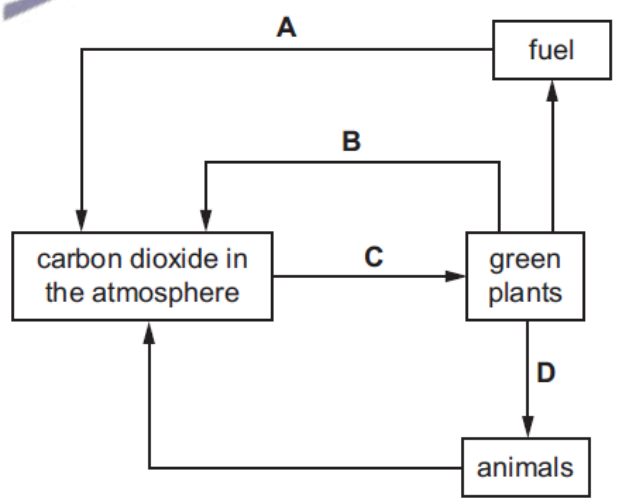
C photosynthesis

D respiration

6. Nov/2023 /Paper_ 0610/13/No.38

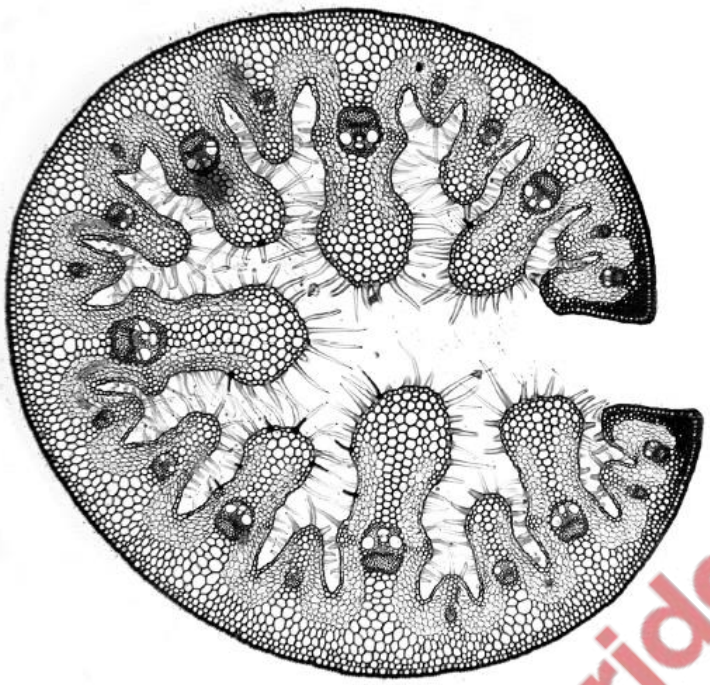
The diagram shows part of the carbon cycle.

Which arrow represents respiration?



7. Nov/2023 /Paper_ 0610/21/No.33

The photomicrograph shows a cross-section through a marram grass leaf.



Which feature is an adaptation of a xerophyte?

A the presence of chloroplasts

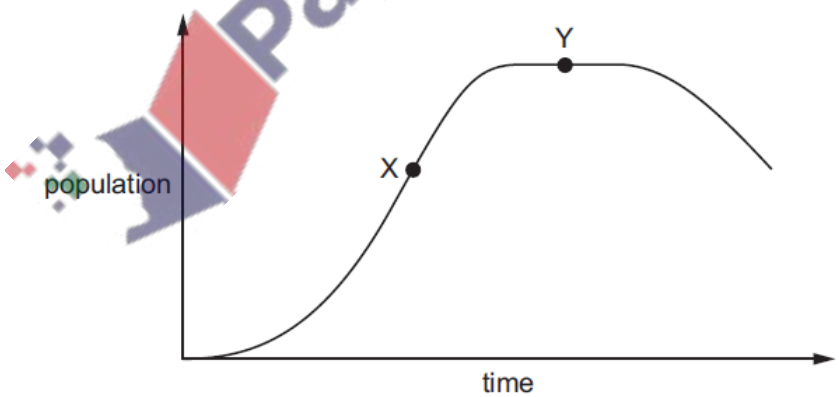
B the presence of fine hairs

C the presence of phloem tissue

D the presence of xylem vessels

8. Nov/2023 /Paper_ 0610/21/No.35

The graph shows the growth of a population of rabbits in one area.



Which statements are correct?

1 At X, the birth rate is higher than the death rate.

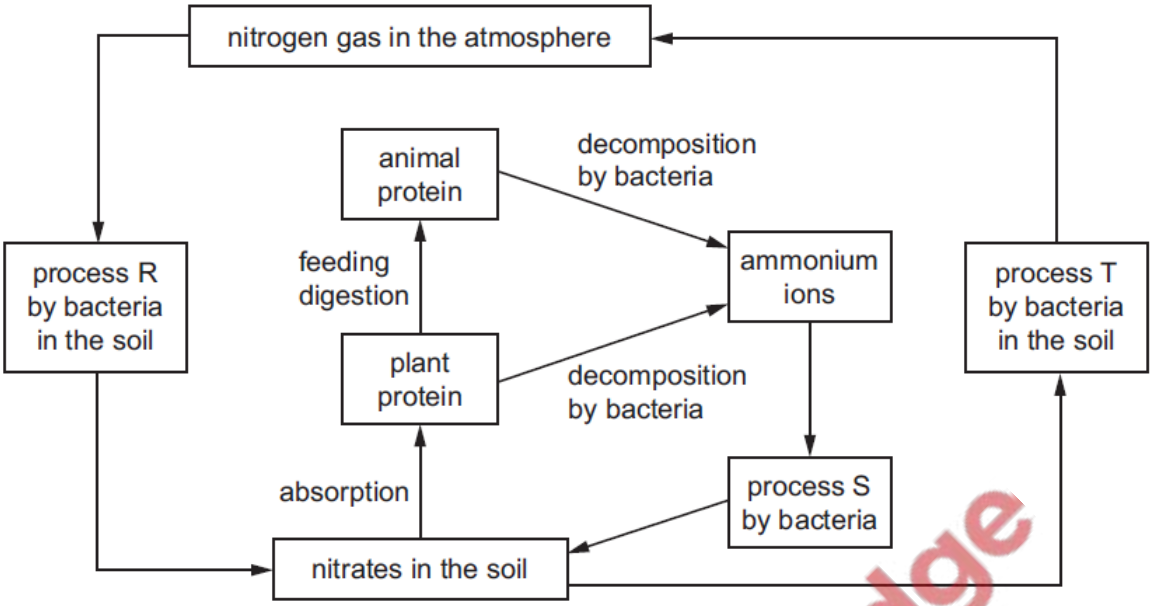
2 At X, there are no deaths and the population is limited by a lack of food.

3 At Y, the birth rate and death rate are equal.

A 1 and 2 **B** 1 and 3 **C** 1 only **D** 2 only

9. Nov/2023 /Paper_ 0610/21/No.37

The diagram shows part of the nitrogen cycle.



Which row shows the correct processes for R, S and T?

	denitrification	nitrogen fixation	nitrification
A	R	S	T
B	T	S	R
C	T	R	S
D	S	R	T

10. Nov/2023 /Paper_ 0610/22/No.35

Which row shows features of xerophytes that reduce water loss?

	green colour from chlorophyll	leaves reduced to spines	presence of stomata	thick cuticle
A	✓	✗	✓	✗
B	✓	✓	✗	✗
C	✗	✓	✗	✓
D	✗	✗	✓	✓

key

✓ = reduces water loss

✗ = does **not** reduce water loss

11. Nov/2023 /Paper_ 0610/22/No.36

The diagram shows a food chain.

tree → insect → blue tit → hawk

Which statement about a pyramid based on this food chain is correct?

A Drawn as a pyramid of biomass, the hawk would have the largest bar size.

B Drawn as a pyramid of energy, the tree would have the largest bar size.

C Drawn as a pyramid of energy, the tree would have the smallest bar size.

D Drawn as a pyramid of numbers, the hawk would have the largest bar size.

12. Nov/2023 /Paper_ 0610/22/No.37

During the nitrogen cycle, which process releases nitrogen gas into the air?

A decomposition

B denitrification

C nitrification

D nitrogen fixation

13. Nov/2023 /Paper_ 0610/23/No.36

In which process in the nitrogen cycle do microorganisms take nitrogen from the air and convert it into nitrogen compounds?

A decomposition

B denitrification

C nitrification

D nitrogen fixation

14. Nov/2023 /Paper_ 0610/31/No.6

(a) The boxes on the left show two terms.

The boxes on the right show the descriptions of some terms.

Draw **one** line to link each term to its description.

Draw **two** lines.

term	description
	a group of organisms that can reproduce to produce fertile offspring
	all of the populations of different species in an ecosystem
community	
	an organism that gets its energy by feeding on other organisms
	a group of organisms of one species, living in the same area, at the same time
population	
	the position of an organism in a food chain, food web or ecological pyramid
	a unit containing the different species of organisms and their environment, interacting together

[2]

(b) The growth of bacteria in a flask containing nutrients was monitored for six hours.

The number of **live** bacteria per cm^3 was estimated every 30 minutes.

Fig. 6.1 shows the results.

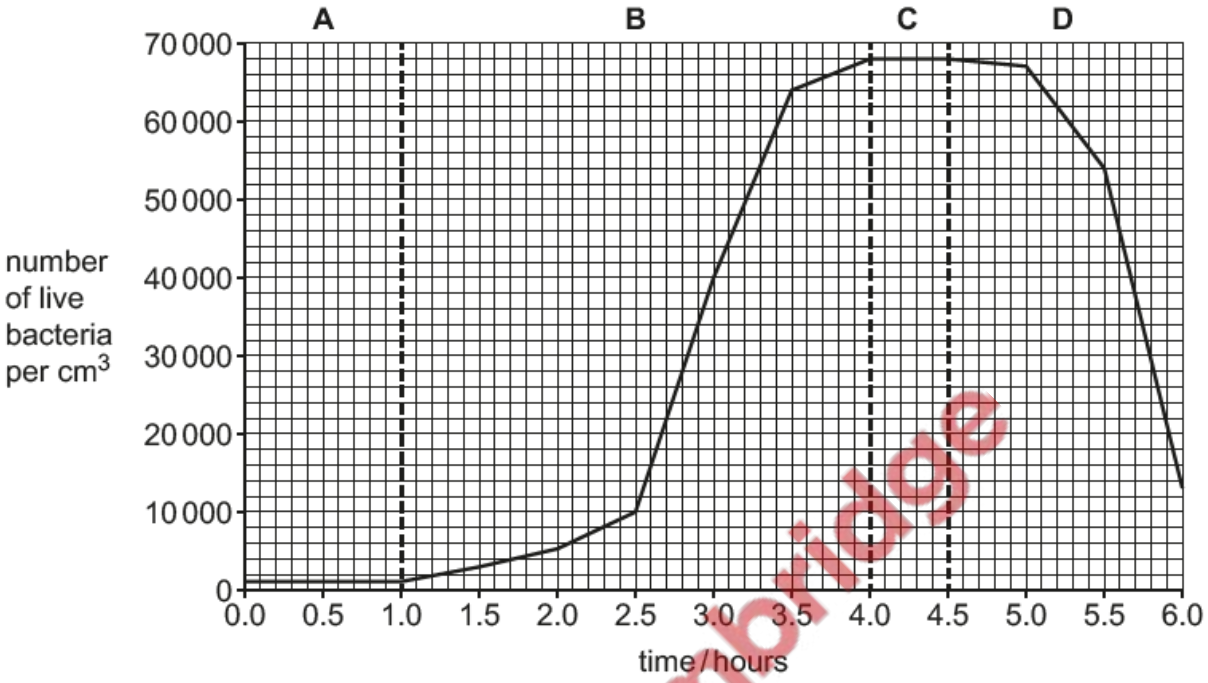


Fig. 6.1

(i) The data in the graph has been divided into four phases: **A**, **B**, **C** and **D**.

The list shows the names of the four phases.

death **exponential** **lag** **stationary**

Use the words from the list to identify phases **A**, **B**, **C** and **D** shown in Fig. 6.1.

A .....

B .....

C .....

D .....

[2]

(ii) Complete the sentences using the data shown in Fig. 6.1 and your knowledge.

The number of live bacteria in phase **A** remained at .....

per cm^3.

In phase **B** the number of live bacteria doubled between 2.0 hours and

..... hours.

The maximum number of live bacteria occurred in phase ..... .

In phase ..... the number of live bacteria decreased because

the bacteria did not have enough ..... .

[5]

[Total: 9]

(a) Fig. 4.1 shows a marine food web.

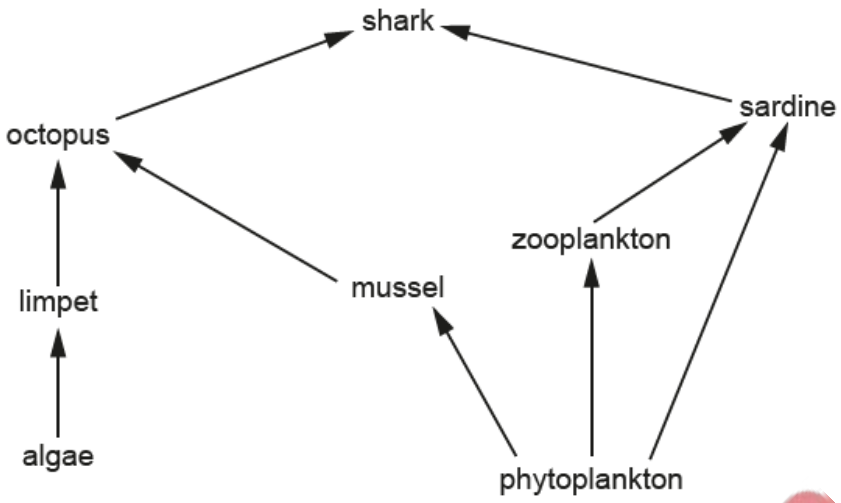


Fig. 4.1

(i) Place ticks (✓) in the boxes to show the correct descriptions for the organisms shown in Fig. 4.1.

organism	carnivore	herbivore	producer	tertiary consumer
algae				
zooplankton				
shark				

[3]

(ii) Construct **one** food chain from Fig. 4.1 that contains **four** organisms including the **octopus**.

..... [2]

(iii) Identify **one** organism in Fig. 4.1 that feeds at the second **and** third trophic levels.

..... [1]

(b) State the name of the type of organism that gets its energy from dead organic material.

..... [1]

(c) State the principal source of energy in most biological systems.

..... [1]

(d) Outline ways humans can directly impact food webs.

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..... [3]

[Total: 11]

16. Nov/2023 /Paper_ 0610/33/No.8

Fig. 8.1 is a diagram showing part of the carbon cycle.

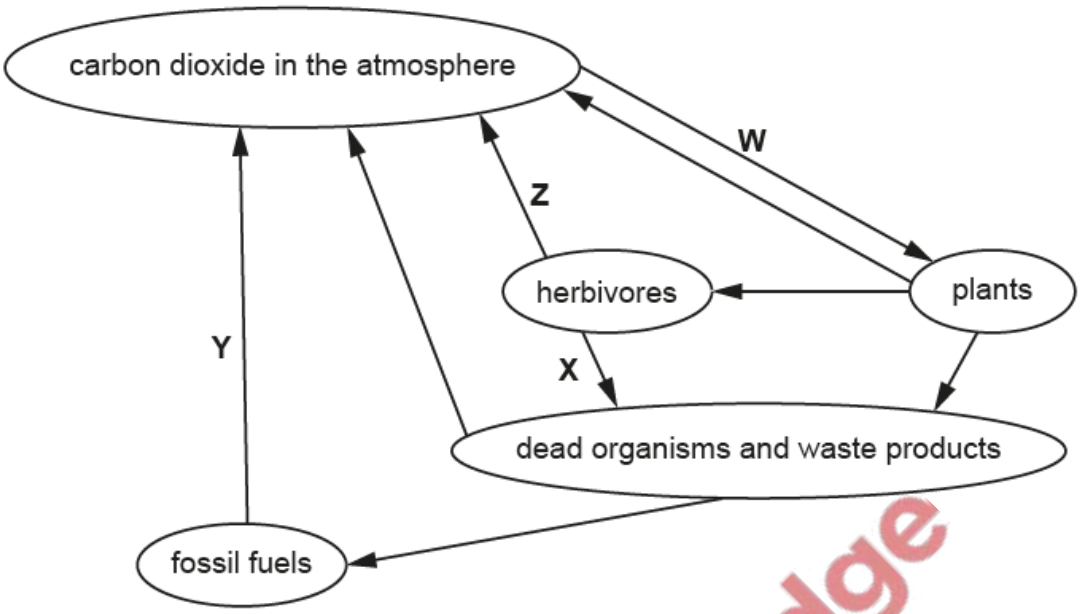

Fig. 8.1

(a) Identify the processes labelled **W**, **X**, **Y** and **Z** in Fig. 8.1.

W .....

X .....

Y .....

Z .....

[4]

(b) State the names of **two** biological molecules found in plants that contain carbon.

1 .....

2 .....

[2]

(c) An increase in the concentration of carbon dioxide in the atmosphere is causing the enhanced greenhouse effect.

State the name of **one** other greenhouse gas.

..... [1]

[Total: 7]

17. Nov/2023 /Paper_ 0610/41/No.5

Fig. 5.1 shows the changes in the percentage of the total global fish stocks that are overfished and those that are sustainable.

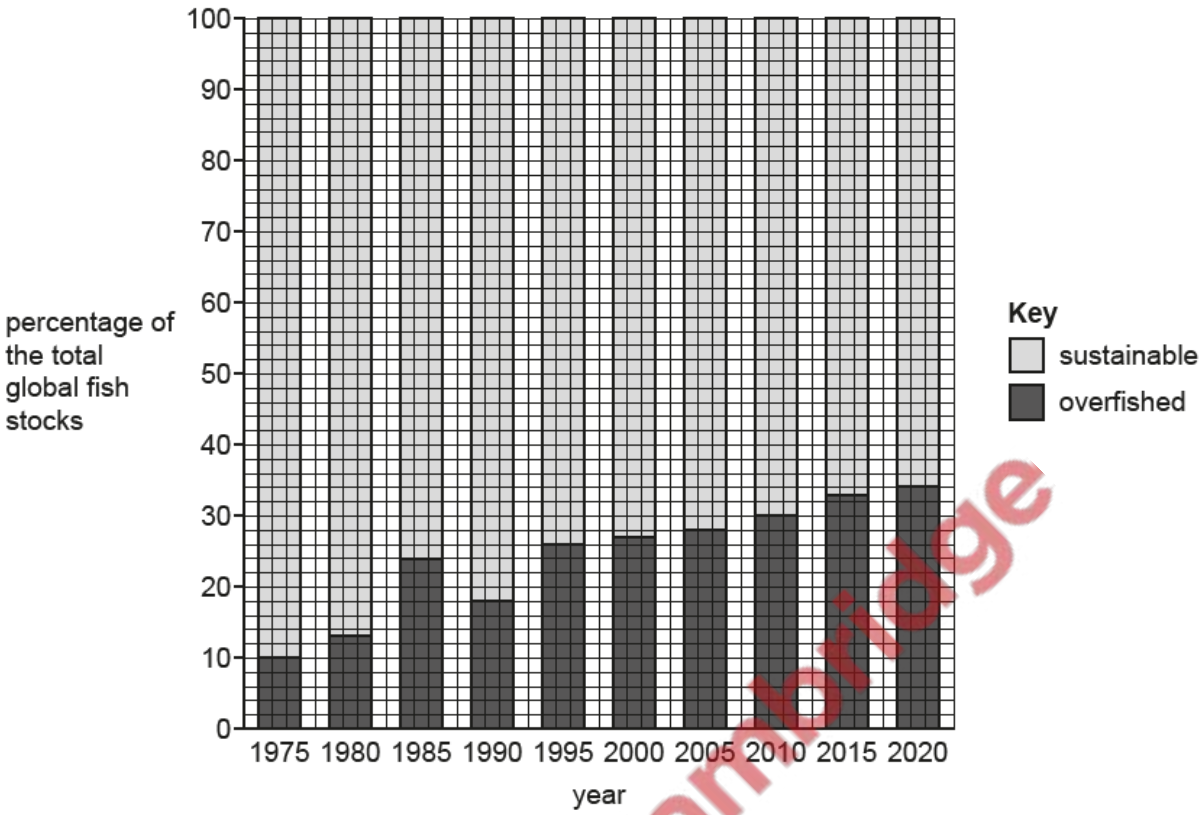

Fig. 5.1

(a) Use the information in Fig. 5.1 to:

(i) State the percentage of fish stocks that were sustainable in 2020.

..... % [1]

(ii) State which five-year period had the greatest increase in sustainable fish populations.

..... [1]

(b) Overfishing is one reason why populations of fish decline.

Explain the risks to a species if its population size decreases.

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..... [3]

(c) Describe **and** explain how fish stocks can be managed sustainably and how overfishing can be prevented through conservation.

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..... [6]

[Total: 11]