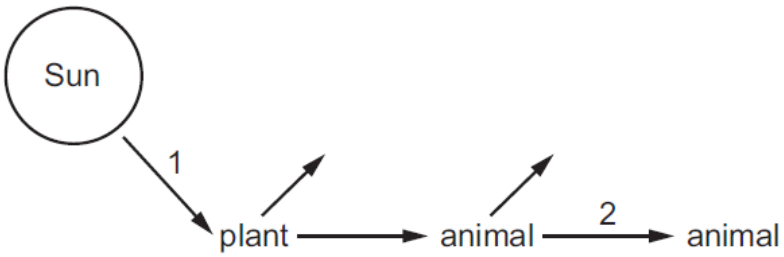
1. June/2023/Paper_0610/11/No.36

The diagram shows energy flow from the Sun, through a food chain and into the environment.



What is the form of energy for each numbered arrow?

	stage 1	stage 2
A	heat	chemical
B	heat	kinetic
C	light	chemical
D	light	kinetic

2. June/2023/Paper_0610/11/No.37

In a pyramid of numbers, what does the top of the pyramid represent?

A carnivores

B decomposers

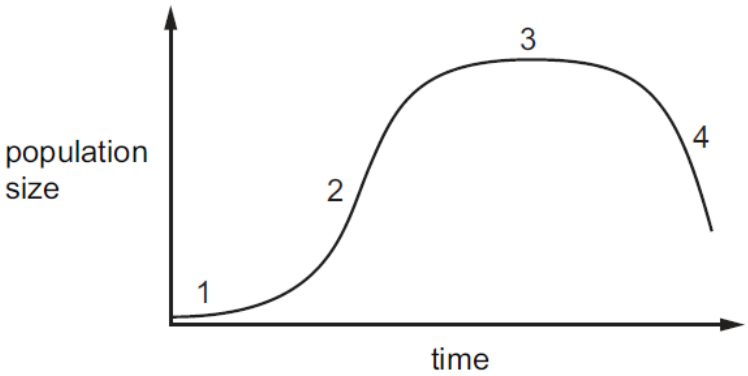
C herbivores

D Sun

3. June/2023/Paper_0610/11/No.38

A few yeast cells were placed in a container of nutrient solution.

The graph shows how their population size changed over time.



Which row shows when the reproduction rate was greater than the death rate for the numbered phases on the graph?

	reproduction rate greater than death rate			
	1	2	3	4
A	✓	✓	✓	✗
B	✓	✓	✗	✗
C	✓	✗	✗	✗
D	✗	✓	✓	✓

key

✓ = yes

✗ = no

4. June/2023/Paper_0610/12/No.36

Which term is used to describe an organism that makes its own organic nutrients?

A carnivore

B decomposer

C herbivore

D producer

5. June/2023/Paper_0610/12/No.37

What is the principal source of energy for most food chains?

A carbon dioxide gas

B glucose

C oxygen

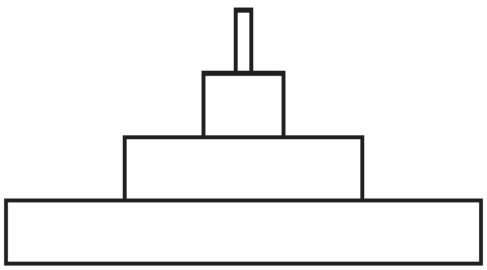
D sunlight

6. June/2023/Paper_0610/12/No.38

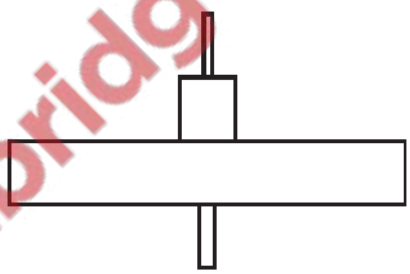
A single tree is food for a large population of caterpillars. Several small birds eat the caterpillars. The small birds are eaten by a bird of prey.

Which is the pyramid of biomass?

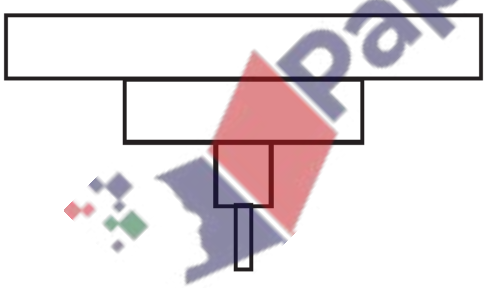
A



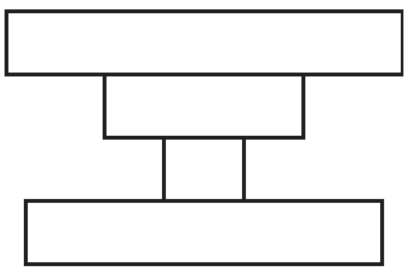
B



C



D



7. June/2023/Paper_0610/13/No.36

Where does the energy being transferred along a food chain originally come from?

A producer

B photosynthesis

C carbon dioxide

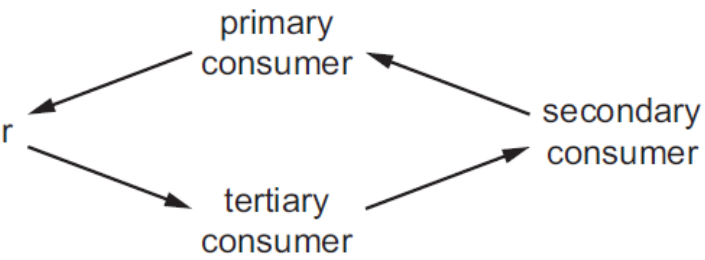
D the Sun

8. June/2023/Paper_0610/13/No.37

Which diagram shows energy passing along a food chain?

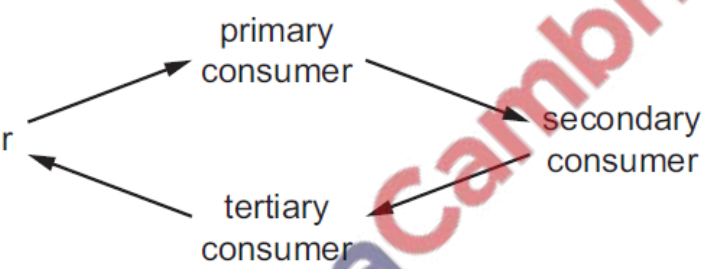
A producer → primary consumer → secondary consumer → tertiary consumer

B



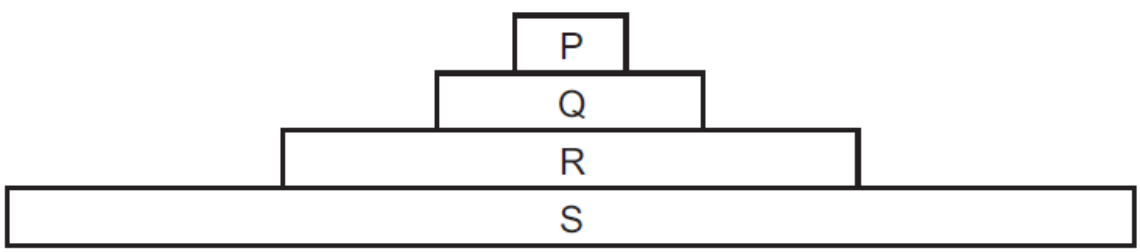
C producer ← primary consumer ← secondary consumer ← tertiary consumer

D



9. June/2023/Paper_0610/13/No.38

The diagram shows a pyramid of biomass for all the organisms in an ecosystem.

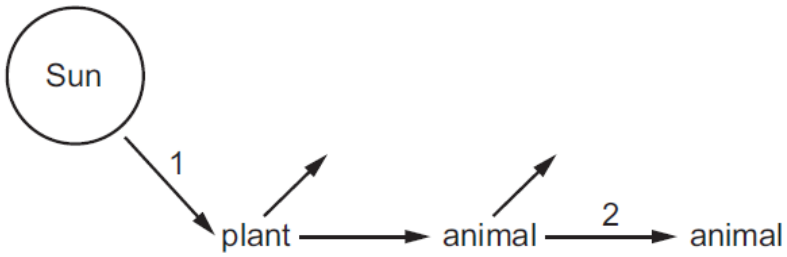


Which organisms are carnivores?

A P and Q **B** P and R **C** Q and R **D** R and S

10. June/2023/Paper_0610/21/No.35

The diagram shows energy flow from the Sun, through a food chain and into the environment.



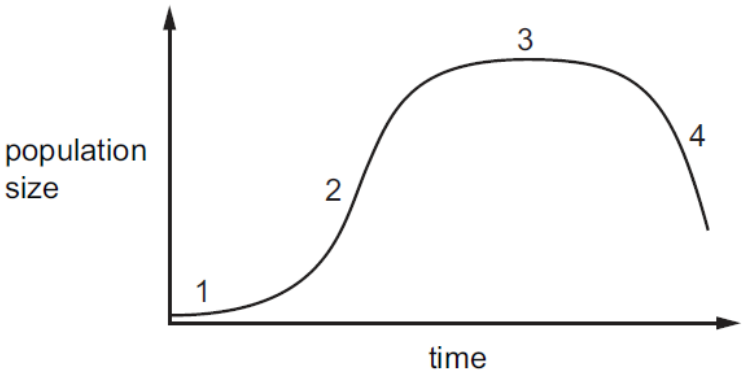
What is the form of energy for each numbered arrow?

	stage 1	stage 2
A	heat	chemical
B	heat	kinetic
C	light	chemical
D	light	kinetic

11. June/2023/Paper_0610/21/No.36

A few yeast cells were placed in a container of nutrient solution.

The graph shows how their population size changed over time.



Which row shows when the reproduction rate was greater than the death rate for the numbered phases on the graph?

	reproduction rate greater than death rate			
	1	2	3	4
A	✓	✓	✓	✗
B	✓	✓	✗	✗
C	✓	✗	✗	✗
D	✗	✓	✓	✓

key

✓ = yes

✗ = no

12. June/2023/Paper_0610/22/No.35

Which term is used to describe an organism that makes its own organic nutrients?

A carnivore

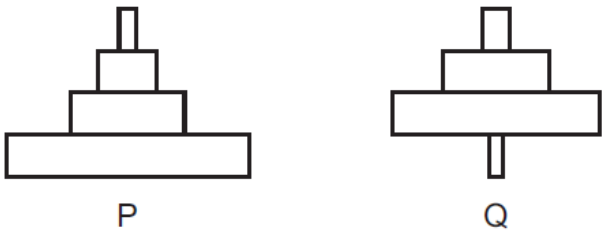
B decomposer

C herbivore

D producer

13. June/2023/Paper_0610/22/No.36

The diagram shows two pyramids based on food chains in which the producer is a large tree.



P Q

What do the two pyramids represent?

	P	Q
A	biomass	biomass
B	biomass	numbers
C	numbers	biomass
D	numbers	numbers

14. June/2023/Paper_0610/23/No.35

Where does the energy being transferred along a food chain originally come from?

A producer

B photosynthesis

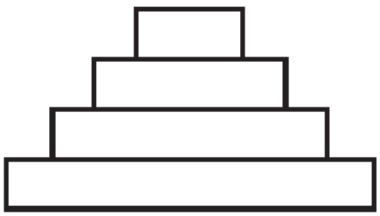
C carbon dioxide

D the Sun

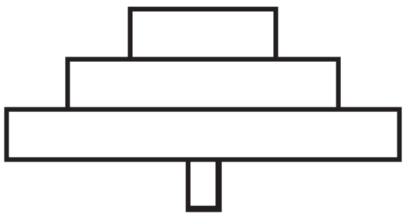
15. June/2023/Paper_0610/23/No.36

Which diagram shows a pyramid of biomass for a forest?

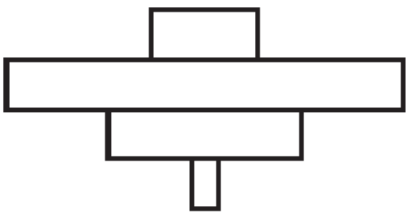
A



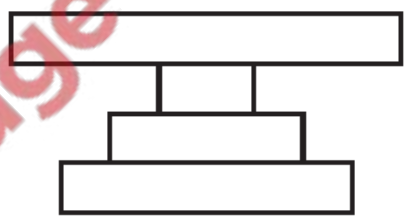
B



C



D



16. June/2023/Paper_0610/31/No.5

Fig. 5.1 shows a pyramid of numbers for a food chain.

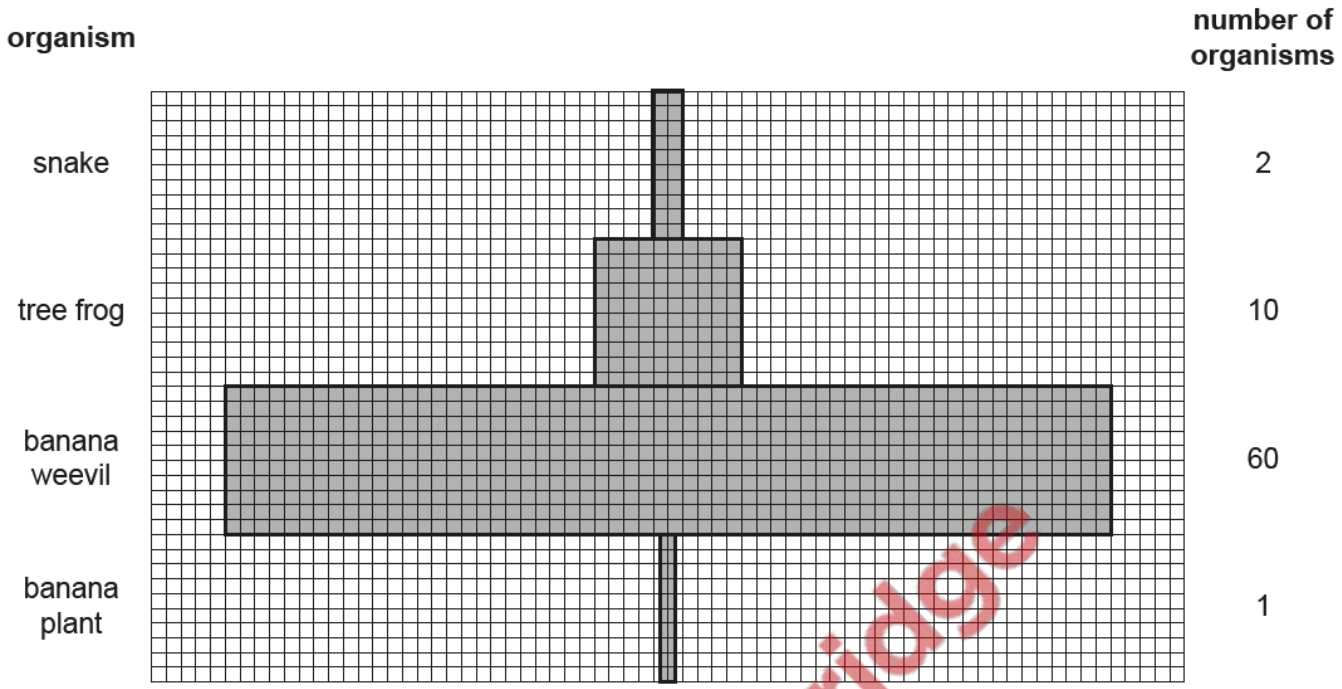


Fig. 5.1

(a) Write the food chain for the pyramid of numbers shown in Fig. 5.1.

..... [2]

(b) Identify the number of trophic levels in Fig. 5.1.

..... [1]

(c) The words in the list can be used to describe the organisms shown in Fig. 5.1.

carnivore **consumer** **decomposer** **herbivore** **producer**

Choose words from the list to describe the:

banana plant .....

tree frog ..... and ..... .

[3]

(d) State **one** advantage of using a pyramid of biomass rather than a pyramid of numbers.

.....

.....

..... [1]

(e) Describe how plants synthesise carbohydrates.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

17. June/2023/Paper_0610/33/No.8

(a) State **one** source of methane gas.

..... [1]

(b) Fig. 8.1 is a graph showing the estimated change in methane concentration in the atmosphere over a thousand-year period.

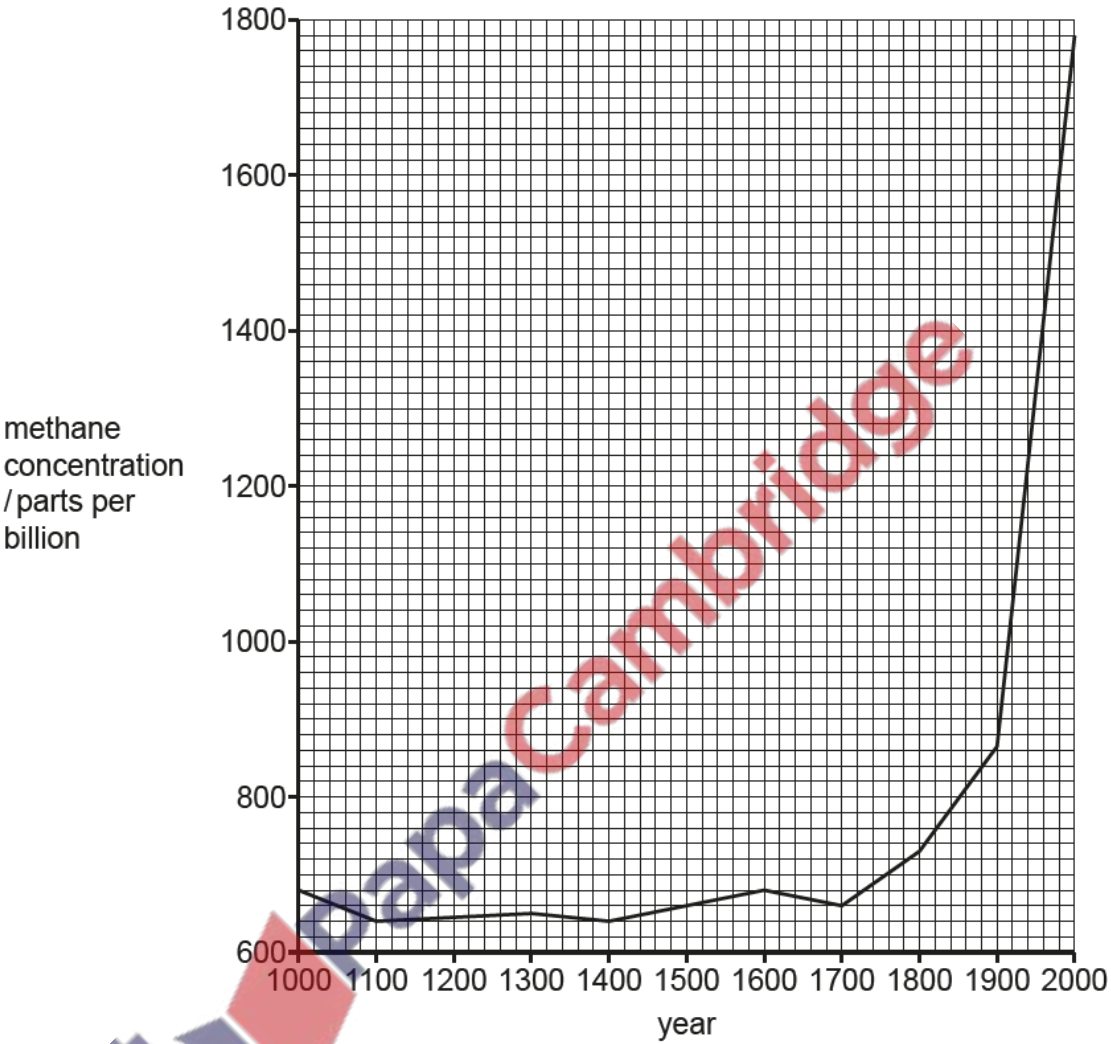


Fig. 8.1

Complete the sentences to describe the changes in methane concentration shown in Fig. 8.1.

The general trend is for methane concentration to ..... .

The concentration of methane was the same in the year 1000 and in the year ..... .

Over the thousand-year period shown in the graph, the concentration of methane has increased by ..... parts per billion.

[3]

(c) **(i)** State **one** process, other than respiration, that releases carbon dioxide into the atmosphere.

..... [1]

(ii) State **two** effects on the environment of increasing carbon dioxide and methane concentrations in the atmosphere.

1 .....

2 .....

[2]

(iii) State **one** natural process that removes carbon dioxide from the atmosphere.

..... [1]

(d) Yeast can be used to produce ethanol for use as a biofuel.

(i) State the name of the process used by yeast to produce ethanol.

..... [1]

(ii) Large amounts of ethanol are required as a biofuel.

Maize is a food plant that is also used to produce ethanol as a biofuel.

Maize grown for ethanol production is grown in large-scale monocultures.

Describe the **disadvantages** of growing crop plants such as maize in a large-scale monoculture.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 12]

18. June/2023/Paper_0610/42/No.4

(a) A student recorded the information about an aquatic habitat.

Fig. 4.1 shows the student's notes.

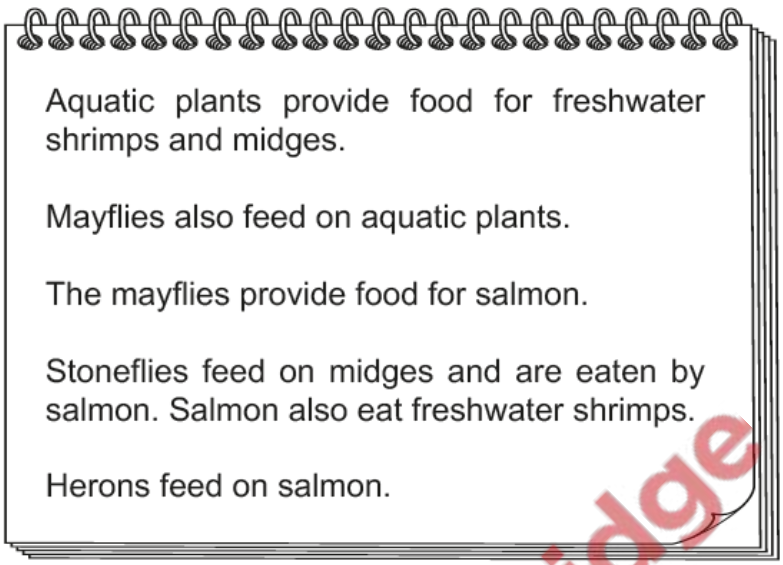


Fig. 4.1

(i) Construct a food web to show the feeding relationships described in Fig. 4.1.

Do **not** draw the organisms.

(ii) Complete Table 4.1 using the information in Fig. 4.1 by identifying the names of the missing trophic levels and **one** organism at each different trophic level.

Table 4.1

name of the trophic level	organism in Fig. 4.1
producer	aquatic plants
primary consumer	
secondary consumer	

[3]

(iii) Outline how the energy in the primary consumers in this aquatic food web is used to produce biomass in the secondary consumers.

.....

.....

.....

.....

.....

.....

..... [3]

(iv) Humans also eat salmon.

Predict the impact on the feeding relationships shown in Fig. 4.1 of overharvesting of salmon.

.....

.....

.....

.....

.....

.....

..... [3]

(b) Describe what is meant by the term decomposer.

.....

.....

..... [1]

(c) Animals such as salmon can be farmed for meat.

Explain why it is more energy efficient for humans to eat crop plants than to eat livestock that have been fed on crop plants.

.....

.....

.....

.....

.....

.....

.....

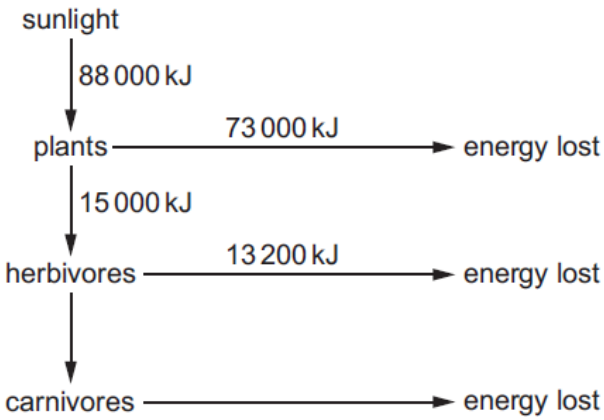
.....

..... [4]

[Total: 18]

19. March/2023/Paper_ 0610/12/No.36

The numbers in the diagram show the amount of energy transferred through part of an ecosystem.



How much energy is transferred from herbivores to carnivores?

A 15 000 kJ + 13 200 kJ

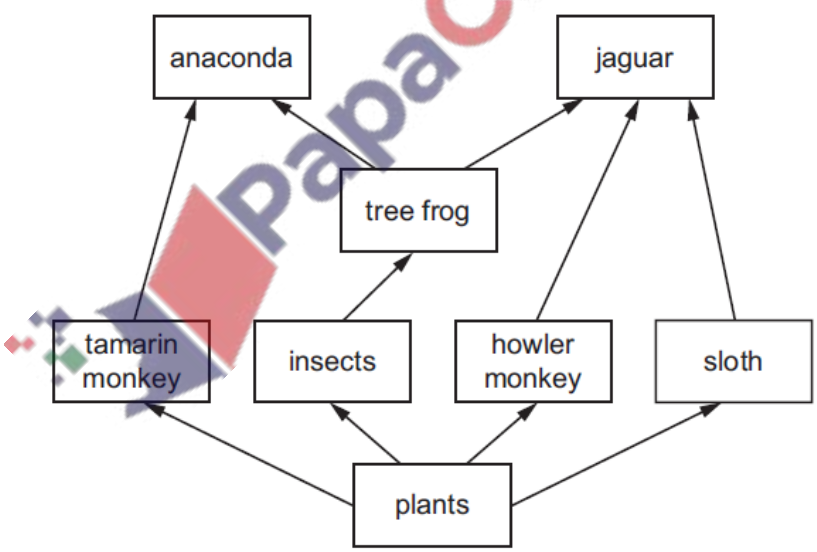
B 15 000 kJ – 13 200 kJ

C 88 000 kJ + 15 000 kJ

D 88 000 kJ – 15 000 kJ

20. March/2023/Paper_ 0610/12/No.37

The diagram shows a food web in a rainforest.

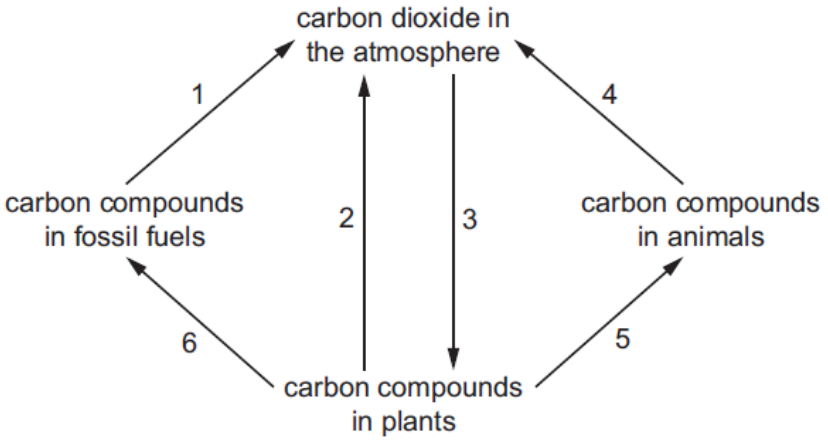


How many trophic levels are shown in this food web?

A 1 **B** 3 **C** 4 **D** 8

21. March/2023/Paper_ 0610/12/No.38

The diagram shows the carbon cycle.



Which labelled processes represent respiration?

A 1 and 4 **B** 1 and 5 **C** 2 and 4 **D** 3 and 6

22. March/2023/Paper_ 0610/22/No.33

Which feature is found in a hydrophytic plant?

A Leaves are curled with stomata on the inside.

B Leaves are reduced to spines.

C Stomata are sunk in pits in the epidermis.

D There is no waxy cuticle.

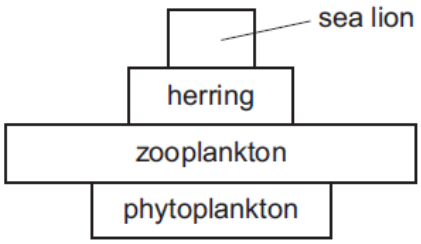
23. March/2023/Paper_ 0610/22/No.35

The diagram shows a food chain.

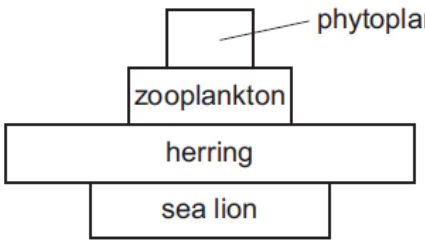
phytoplankton → zooplankton → herring → sea lion

Which diagram shows a pyramid of energy for this food chain?

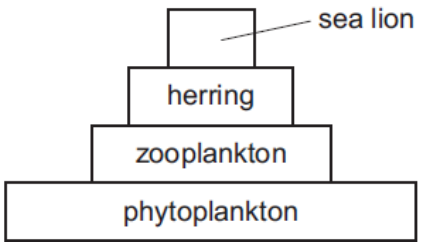
A



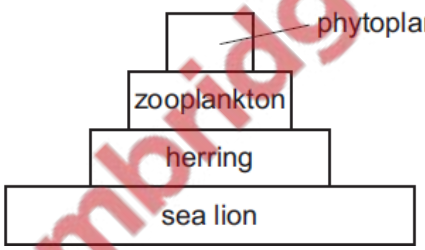
B



C

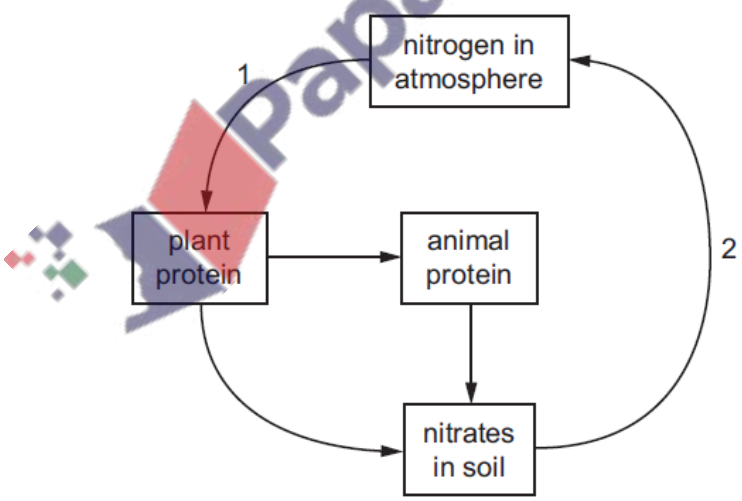


D



24. March/2023/Paper_ 0610/22/No.36

In the nitrogen cycle, what are processes 1 and 2?



	process 1	process 2
A	decomposition	nitrification
B	denitrification	nitrogen fixation
C	nitrification	evaporation
D	nitrogen fixation	denitrification

25. March/2023/Paper_ 0610/32/No.6

Fig. 6.1 is a diagram representing part of the carbon cycle.

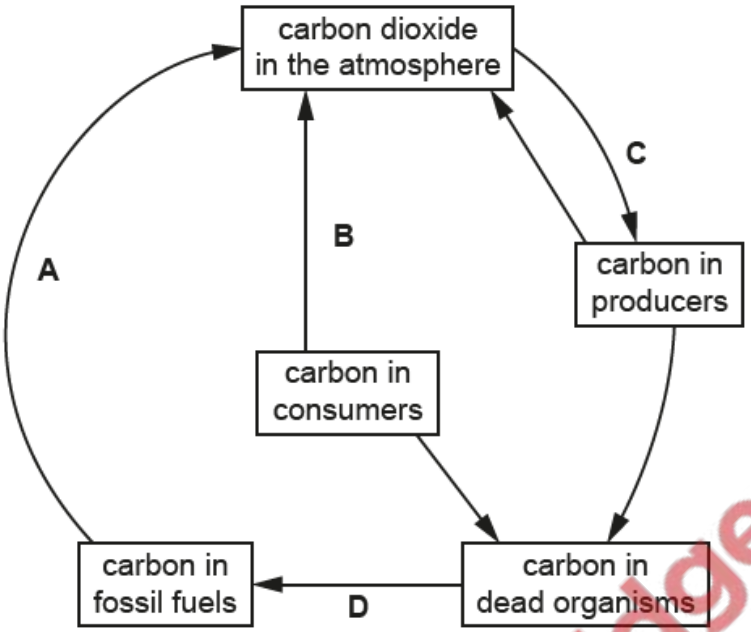


Fig. 6.1

(a) Using the information in Fig. 6.1, identify the number of processes that remove carbon dioxide from the atmosphere.

..... [1]

(b) The boxes on the left show letters representing processes in Fig. 6.1.

The boxes on the right show the names of some processes.

Draw lines to link each letter to the correct process.

Draw **four** lines.

letter in Fig. 6.1	process
	combustion
A	
	decomposition
B	
	formation of fossil fuel
C	
	photosynthesis
D	
	respiration

[4]

(c) Energy is transferred through feeding in food webs.

(i) Draw an arrow **on Fig. 6.1** to represent the process of herbivores feeding. [1]

(ii) State the principal source of energy in most food webs.

..... [1]

(d) Explain why fossil fuels **cannot** be described as a sustainable resource.

.....

.....

.....

.....

.....

[2]

(e) Deforestation can cause an increase in the carbon dioxide concentration in the atmosphere.

State **two other** undesirable effects of deforestation.

1 .....

2 .....

[2]

(f) Adding extra carbon dioxide to the atmosphere causes an enhanced greenhouse effect.

(i) State the usual concentration of carbon dioxide in the atmosphere.

..... % [1]

(ii) State **one other** pollutant that causes an enhanced greenhouse effect.

..... [1]

[Total: 13]