

Biodiversity, Classification and Conservation

Question Paper 2

Level	International A Level
Subject	Biology
Exam Board	CIE
Topic	Biodiversity, Classification and Conservation
Sub Topic	
Booklet	Multiple Choice
Paper Type	Question Paper 2

Time Allowed : 40 minutes

Score : / 33

Percentage : /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

- 1 Two different ecosystems of the same size, X and Y, were compared. Both ecosystems have the same climate.
The results of the comparison are shown.

ecosystem X	ecosystem Y
greater number of trophic levels	fewer number of trophic levels
lower proportion of decomposers	higher proportion of decomposers
dominant producer is smaller and non-woody	dominant producer is larger and woody
has smaller fluctuation in environmental temperature	has larger fluctuation in environmental temperature
has less oxygen	has more oxygen

Using the information in the table, which statement is **not** a valid suggestion concerning X and Y?

- A** A greater percentage of primary producers are likely to be consumed by primary consumers in X than in Y.
- B** X could be a marine aquatic ecosystem and Y could be a terrestrial ecosystem.
- C** Energy losses between trophic levels are likely to be lower for X than for Y.
- D** There is likely to be a higher rate of photosynthesis and production of organic matter in X than in Y.
- 2 In a mangrove ecosystem, leaves from the grey mangrove plants fall into the water and sink to the mud below. They are then broken down by bacteria and fungi.

Invertebrates such as crabs, prawns, and molluscs live in the mud and feed on the dead leaves. The bullseye fish feeds on the invertebrates. Humans eat prawns, crabs and fish.

Hérons and other wading birds live and breed in the mangroves. These birds feed on invertebrates and fish.

What is correct about this ecosystem?

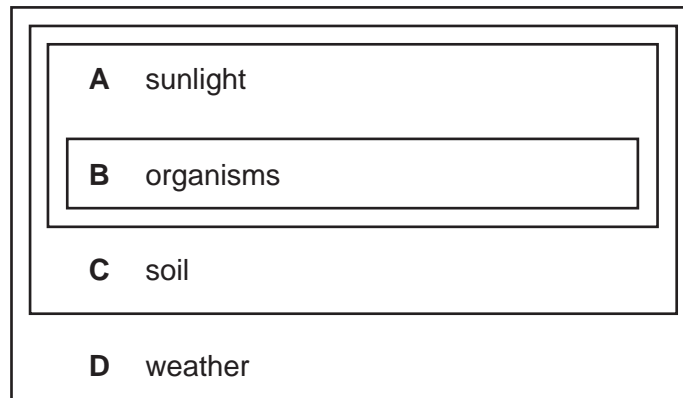
- A** Bacteria, fungi, crabs, prawns and molluscs form the community in the mud.
- B** Bullseye fish are at the second trophic level in the food web.
- C** Fungi in the water are the main producers in the ecosystem.
- D** Grey mangroves are the ecological niche of herons.

- 3 Two species of birds feed on different insects living on the same tree and so do not compete for food.

Which statement describes these two species of birds?

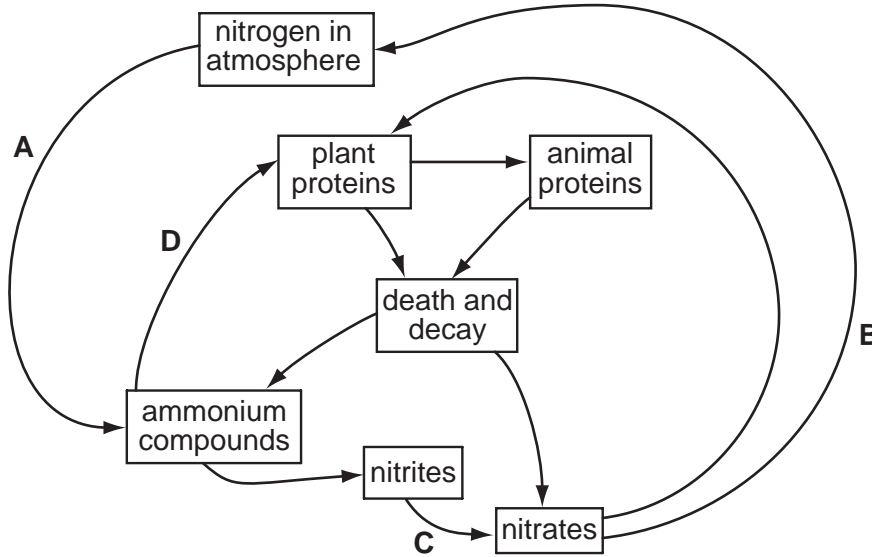
- A They occupy different habitats in the same ecosystem.
- B They occupy the same habitat in the same ecosystem.
- C They occupy different niches in the same habitat.
- D They occupy the same niche in the same habitat.

- 4 Which box encloses a community?



5 The diagram shows a simplified nitrogen cycle.

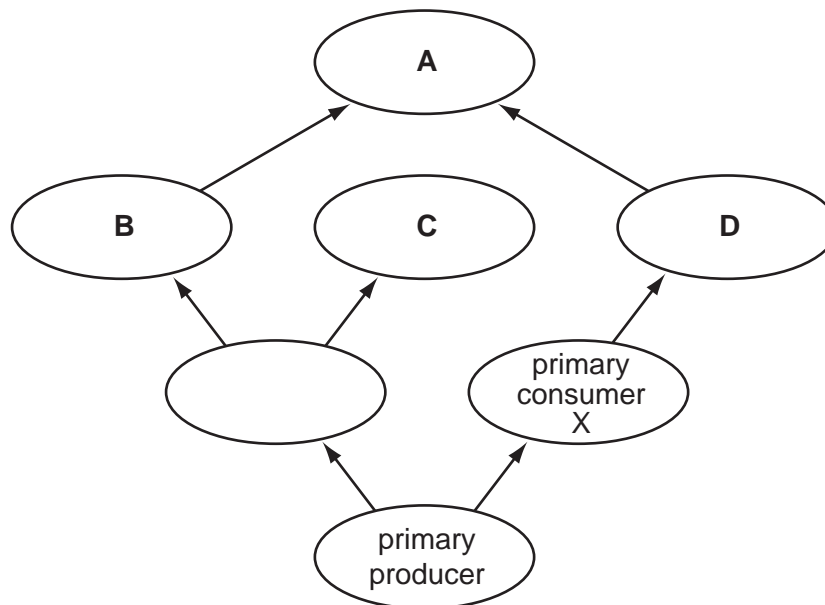
Which arrow represents the activity of nitrogen-fixing bacteria?



6 A primary consumer, X, is removed from a community due to a lethal viral infection.

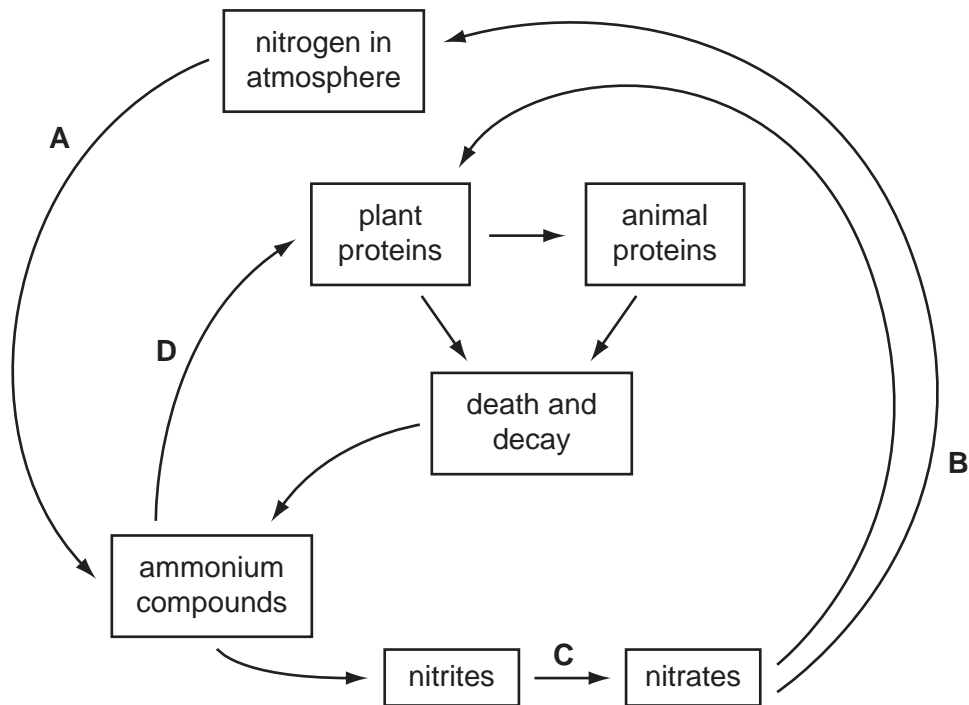
After a time, the size of the populations of some of the organisms shown in the food web changed.

Which population of organisms increased?



7 The diagram shows a simplified nitrogen cycle.

During which stage does nitrification take place?



8 The total rate at which producers synthesise organic material is called gross primary productivity (GPP). The rate at which producers store organic material as new tissue is called net primary productivity (NPP).

What shows the relationship between GPP and NPP?

- A $NPP = GPP \times \text{respiration}$
- B $NPP = GPP \div \text{respiration}$
- C $NPP = GPP + \text{respiration}$
- D $NPP = GPP - \text{respiration}$

9 A tree carries out photosynthesis and provides organic compounds for other organisms in a forest.

It takes carbon dioxide from and returns oxygen to the atmosphere.

It takes water from the soil into its roots and its leaves lose water to the atmosphere.

Many other organisms live in the tree.

Which term describes the tree?

- A niche
- B community
- C ecosystem
- D trophic level

10 Breast milk produced by the mother for a new-born baby contains antibodies.

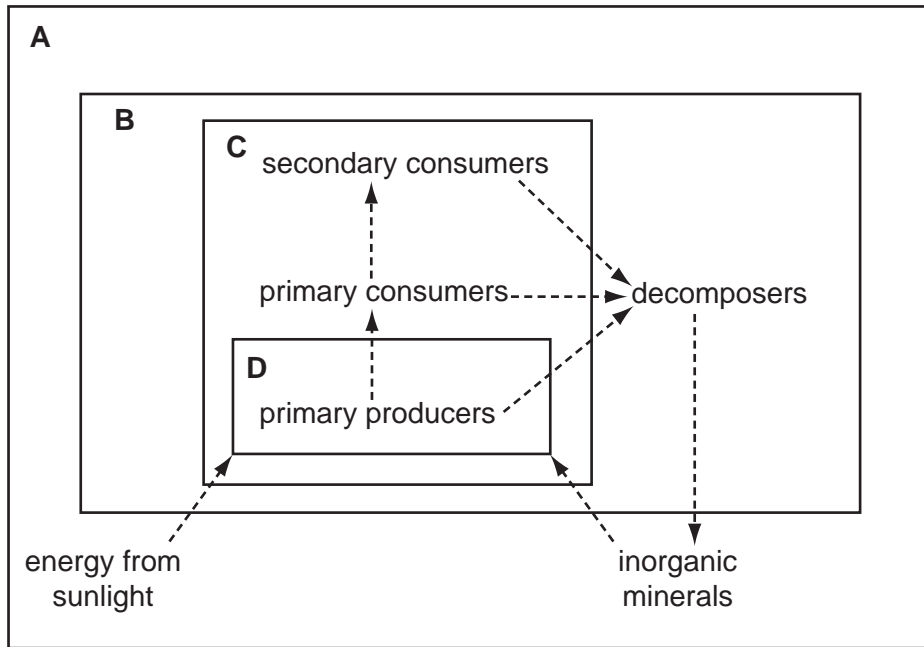
What do these antibodies provide?

- A artificial active immunity
- B artificial passive immunity
- C natural active immunity
- D natural passive immunity

11 Which group could be a population?

- A all the animals and plants on an isolated island
- B all the birds counted in one day in a garden
- C all the bacteria in a colony of *Bacillus subtilis*
- D all the insects occupying three hectares of farmland

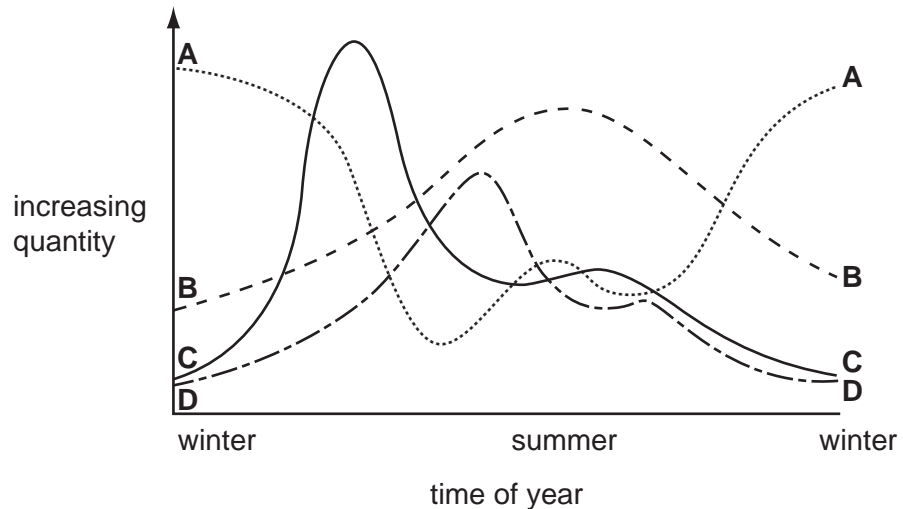
12 Which box contains only the parts of an ecosystem which are classed as a food web?



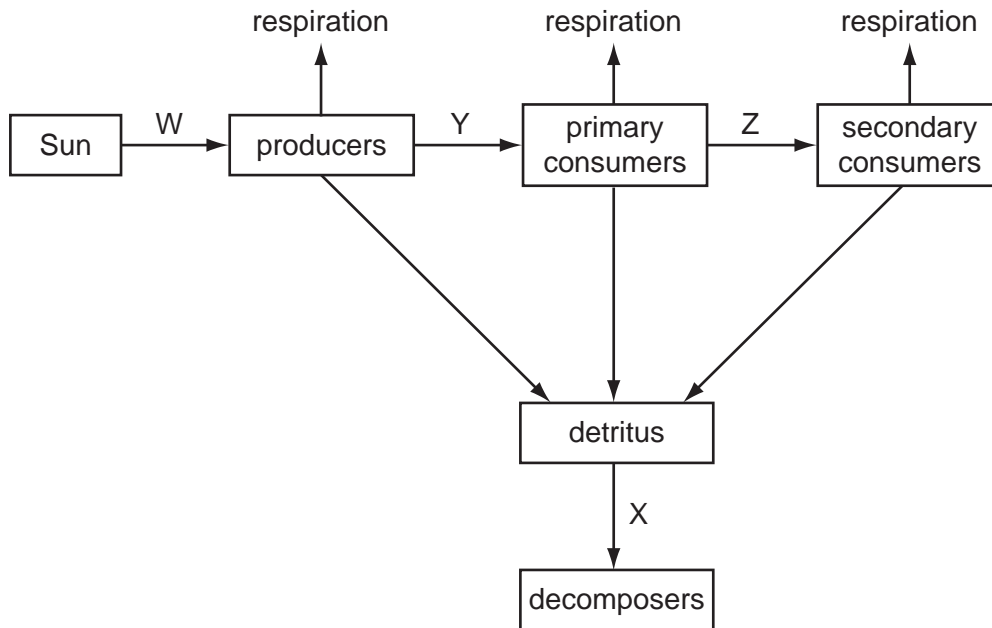
13 The graph shows the annual changes of the following factors in a lake.

- intensity of light per day
- numbers of producers
- numbers of primary consumers
- quantity of nutrients

Which curve represents the numbers of primary consumers?



14 The diagram represents the flow of energy through a tropical rainforest ecosystem.



Which set of figures identifies the percentage transfer of energy between the Sun, producers, consumers and decomposers?

	W	X	Y	Z
A	1	10	20	80
B	1	20	10	80
C	10	20	1	10
D	10	10	1	20

15 A farmer grows a different crop in a field each year for three years.

In the fourth year the farmer plants a leguminous crop and then ploughs this into the soil. The next year the rotation starts again.

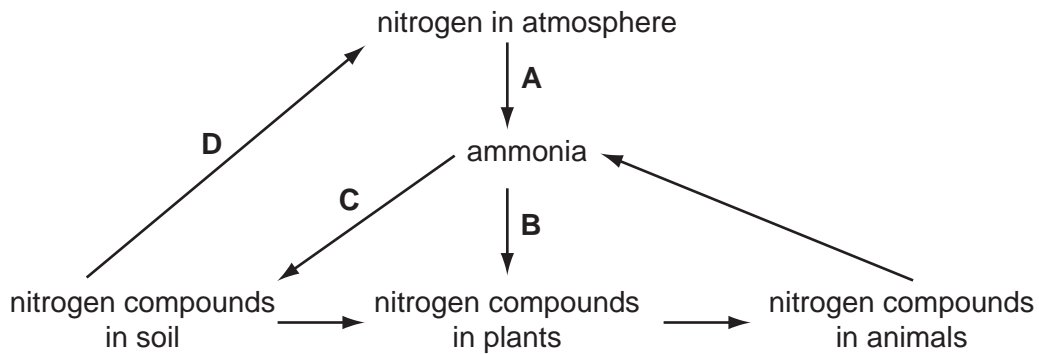
Which microorganisms will increase by the time the rotation starts again?

- 1 denitrifying bacteria
- 2 nitrifying bacteria
- 3 nitrogen-fixing bacteria
- 4 decomposing bacteria

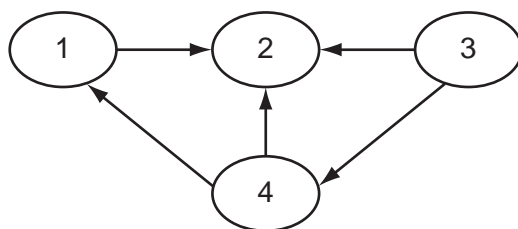
A 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

16 The diagram represents part of the nitrogen cycle.

Which process is carried out by nitrifying bacteria?



17 The diagram shows the flow of energy between organisms in an ecosystem.



Which correctly identifies each organism in the ecosystem?

	1	2	3	4
A	primary consumers	decomposers	secondary consumers	producers
B	primary consumers	secondary consumers	producers	decomposers
C	secondary consumers	decomposers	producers	primary consumers
D	secondary consumers	primary consumers	decomposers	producers

18 A tree carries out photosynthesis and provides organic compounds for other organisms in a forest. It takes carbon dioxide from and returns oxygen to the atmosphere. It takes water from the soil into its roots and its leaves lose water to the atmosphere. Many other organisms live in the tree.

Which term applies to the description of the tree?

- A ecosystem
- B habitat
- C niche
- D trophic level

- 19 In an investigation, discs of 2.5 cm diameter were cut from leaves. Fifty discs were put into three identical bags with different net sizes and buried in newly dug soil at a depth of 3 cm.

At 60 day intervals the bags were dug up and the leaf discs measured to see how much of the leaf area had disappeared.

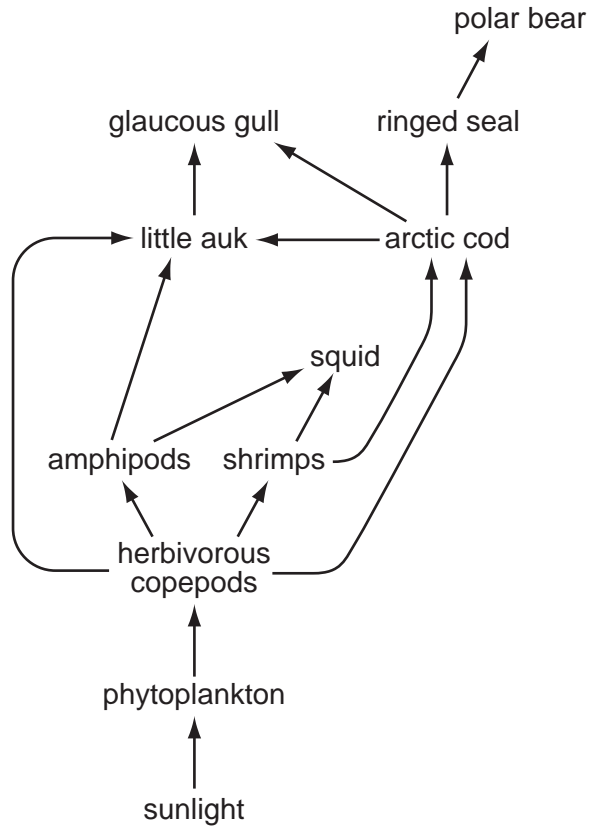
The table shows the percentage of leaf discs remaining in each bag.

time / days	percentage of leaf disks remaining		
	net size 7 mm	net size 0.5 mm	net size 0.03 mm
0	100	100	100
60	80	94	100
120	30	81	100
180	14	67	100
240	9	63	100
300	6	61	100

Which organisms are most important for breaking down the leaves?

- A earthworms and beetles
- B microorganisms only
- C small invertebrates only
- D small invertebrates and microorganisms

20 The diagram shows an arctic ecosystem.

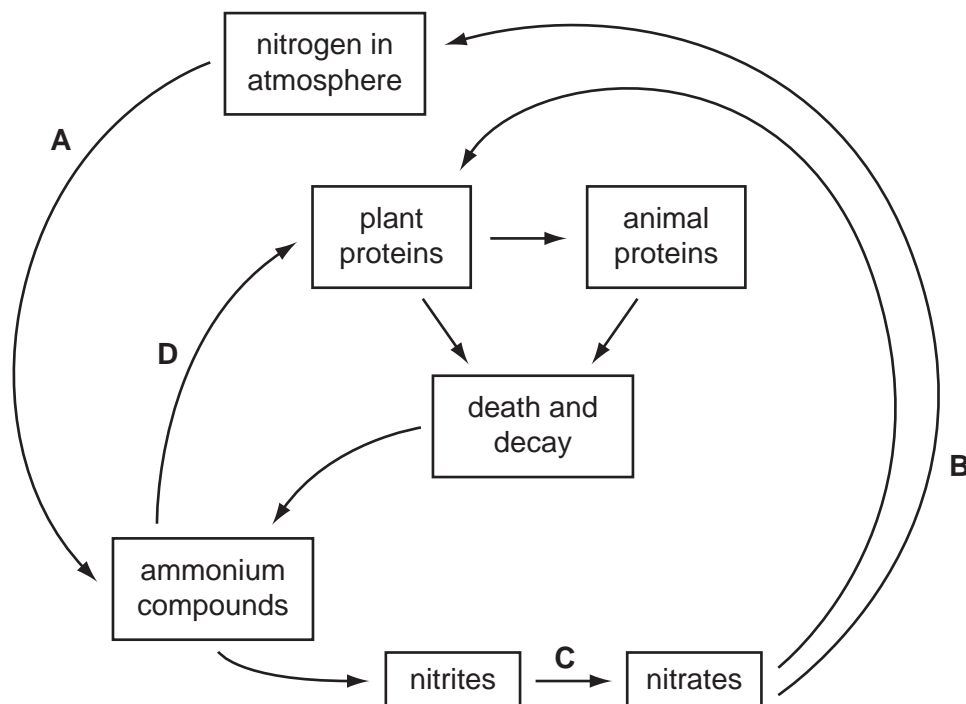


How many trophic levels are represented?

- A 3
- B 4
- C 5
- D 6

21 The diagram shows a simplified nitrogen cycle.

During which stage does nitrification take place?



22 Grasshoppers eat only the leaves of grass. Grasshoppers are eaten by carnivorous beetles.

What does this description of grasshoppers give us sufficient information to define?

- 1 habitat
- 2 niche
- 3 trophic level

A 2 only

B 3 only

C 2 and 3 only

D 1, 2 and 3

- 23 Which statement explains why two species **cannot** permanently occupy the same ecological niche?
- A The two species could not interbreed.
 - B The two species may be part of separate food webs.
 - C The two species would compete for the same resources.
 - D The two species would have different nutritional requirements.
- 24 Following an environmental disaster of a major volcanic eruption, the atmosphere contains greatly increased amounts of dust.

How does this affect the following organisms?

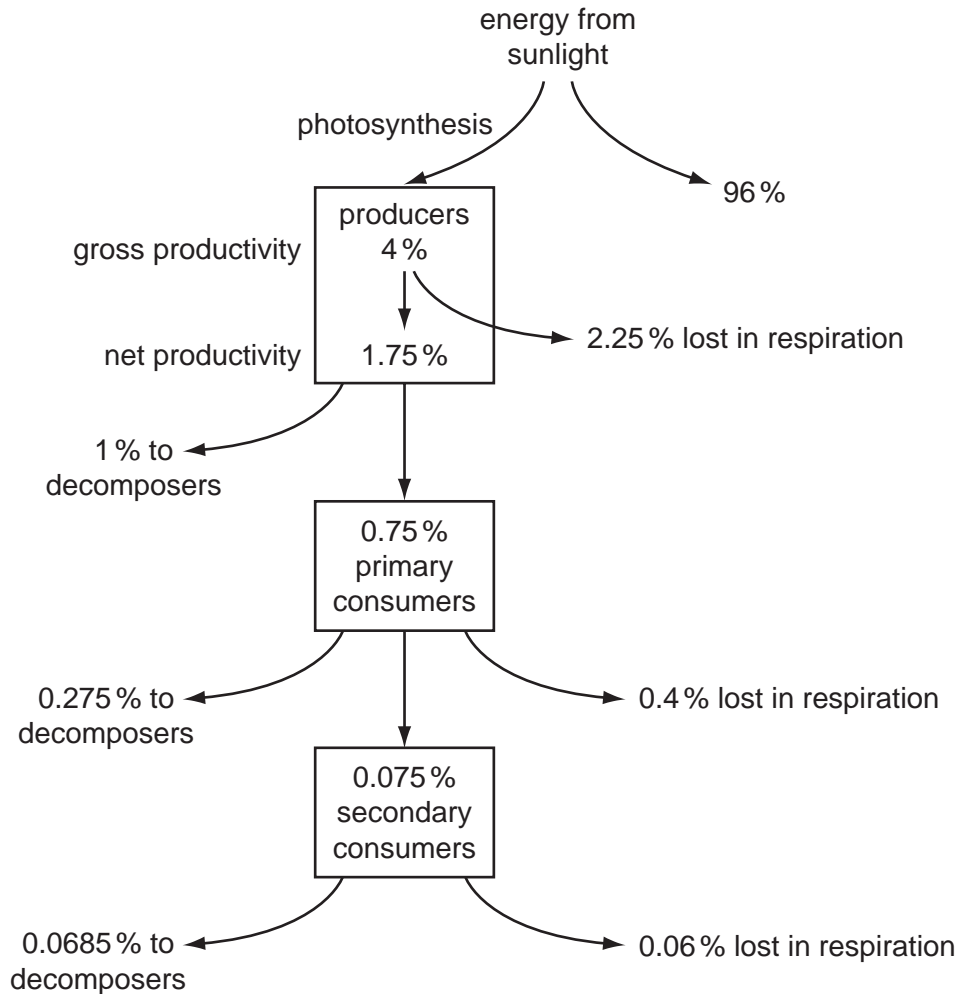
	nitrifying bacteria	primary consumer	producer	secondary consumer
A	decrease	increase	increase	increase
B	increase	decrease	decrease	decrease
C	increase	no change	no change	decrease
D	no change	increase	decrease	no change

- 25 The diagram shows the flow of energy through an ecosystem. Photosynthesis is the **gross productivity**. Producers lose some energy in respiration and the energy left is the **net productivity**.

This can also be expressed as an equation:

$$\text{Net Productivity (NP)} = \text{Gross Productivity (GP)} - \text{Respiration (R)}$$

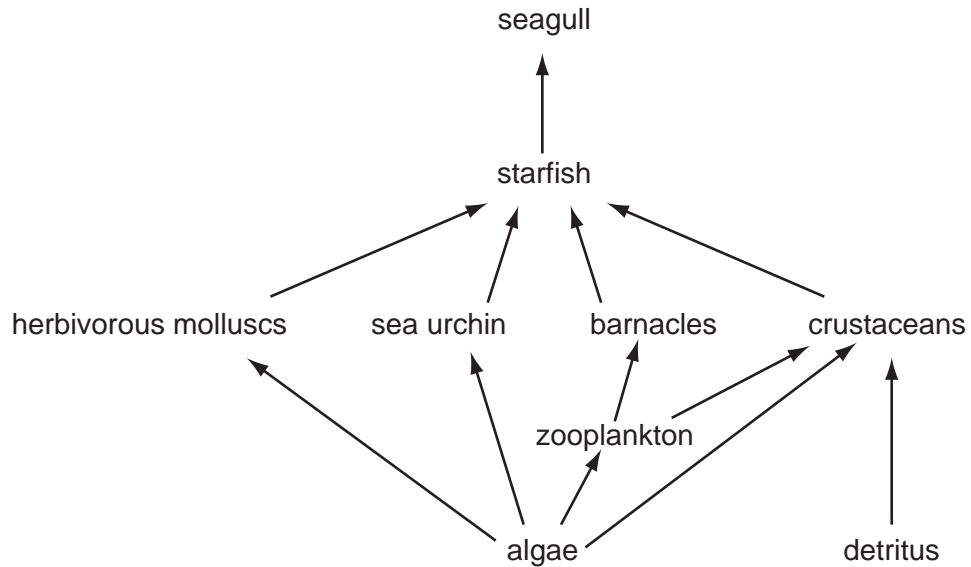
Some of the net productivity passes to herbivores.



Which calculation gives the proportion of **net** productivity passing to herbivores?

- A $\frac{0.075}{1.75}$ B $\frac{0.75}{4}$ C $\frac{0.75}{1.75}$ D $\frac{(0.75+0.075)}{1.75}$

26 The diagram shows a food web.

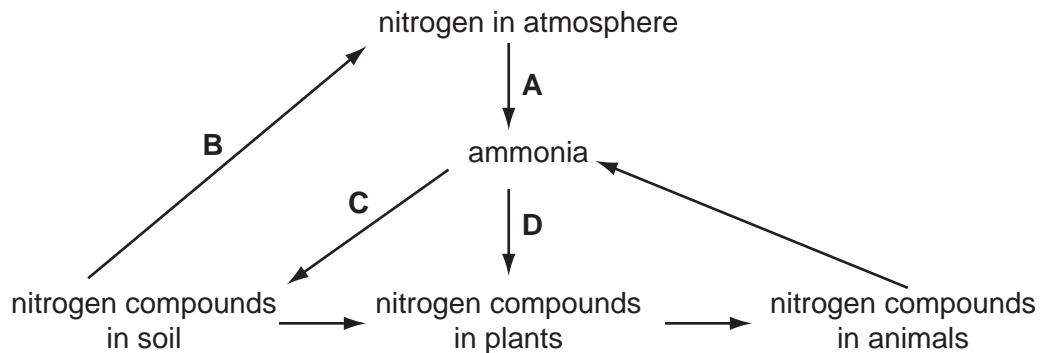


How many trophic levels are represented in the food web?

- A** 3 **B** 4 **C** 5 **D** 6

27 The diagram represents part of the nitrogen cycle.

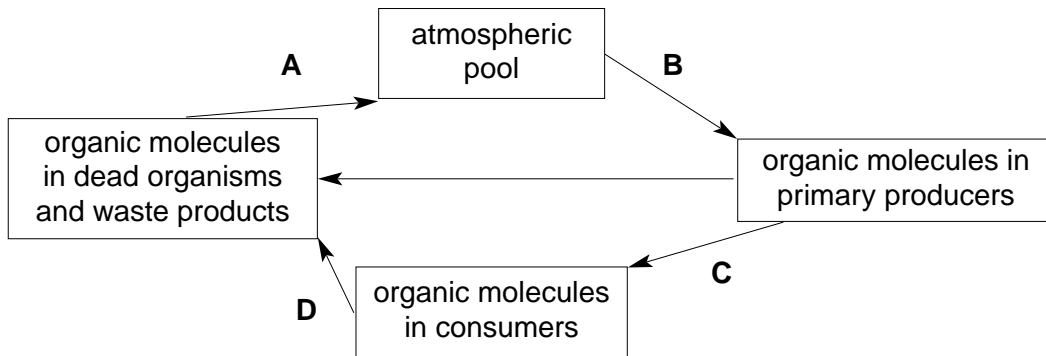
Which process is carried out by nitrifying bacteria?



- 28 Why does the application of nitrate fertilisers cause an increase in crop production?
- A Green plants manufacture more protein.
 - B More nitrogen is fixed in leguminous plants.
 - C The fertiliser adds energy to the ecosystem.
 - D The number of denitrifying bacteria decreases.
- 29 What name is given to all the organisms of different species living in an area?
- A community
 - B ecosystem
 - C niche
 - D population
- 30 How does denitrification occur in the soil?
- A active uptake of nitrate ions by plant roots
 - B bacterial reduction of nitrate ions to nitrogen gas
 - C drainage of manured fields
 - D leaching of nitrate ions
- 31 What name is given to all the organisms of the same species living in an area?
- A community
 - B ecosystem
 - C niche
 - D population

32 The diagram shows the general pattern of a nutrient cycle, such as the nitrogen cycle.

During which stage in the nitrogen cycle are denitrifying bacteria involved?



33 The diagram shows part of the carbon cycle.

Which arrow represents the release of carbon dioxide in respiration?

