

Carbon & Nitrogen Cycles

Question Paper

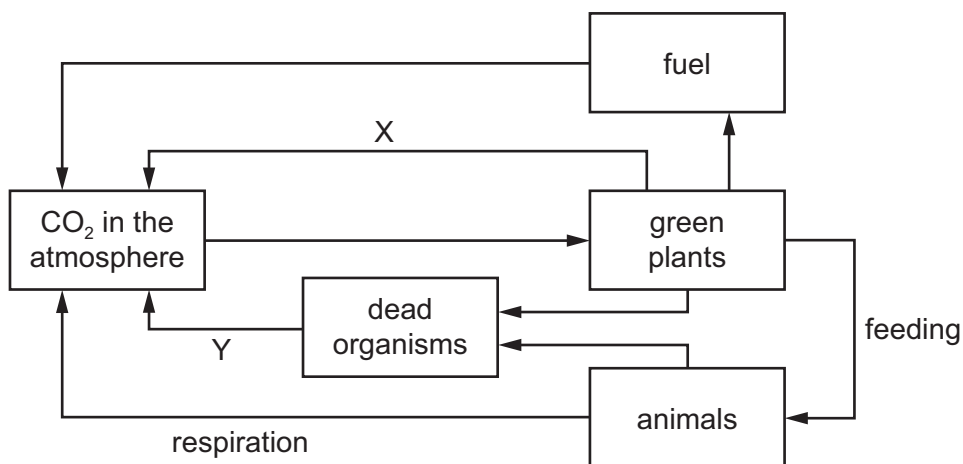
Level	O Level
Subject	Biology
Exam Board	Cambridge International Examinations
Topic	Relationships of organisms with one another and the environment
Sub Topic	Carbon & Nitrogen Cycles
Booklet	Question Paper

Time Allowed: 35 minutes

Score: /29

Percentage: /100

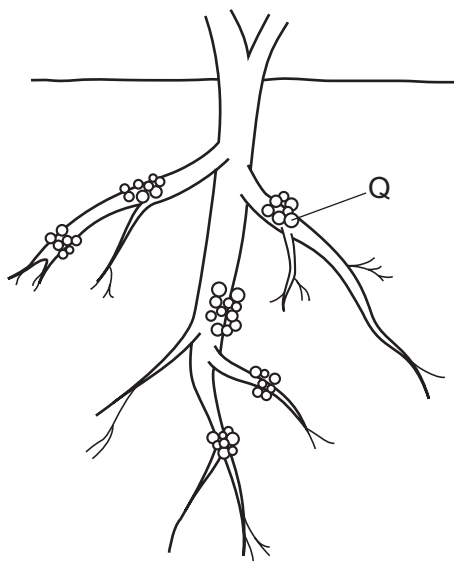
1 The diagram shows part of the carbon cycle.



What are the processes X and Y?

	X	Y
A	photosynthesis	decomposition
B	photosynthesis	excretion
C	respiration	photosynthesis
D	respiration	respiration

2 The diagram shows some structures, Q, on the roots of a bean plant.



Which chemical change fixes nitrogen in these structures?

- A ammonium salts to nitrates
- B nitrogen to ammonium salts
- C proteins to amino acids
- D proteins to ammonium salts

3 Which organisms convert ammonium compounds to nitrates?

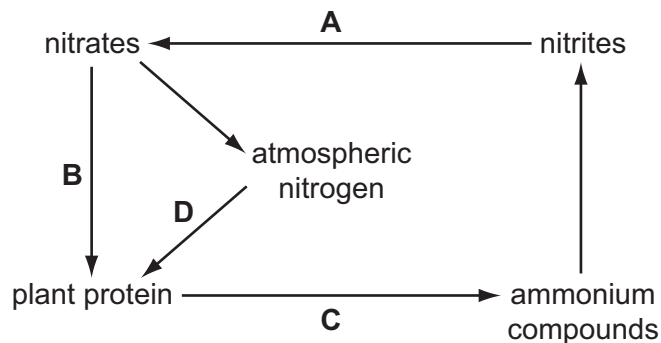
- A decomposing bacteria
- B decomposing fungi
- C nitrifying bacteria
- D nitrogen-fixing bacteria

4 How do nitrogen-fixing bacteria improve soil fertility?

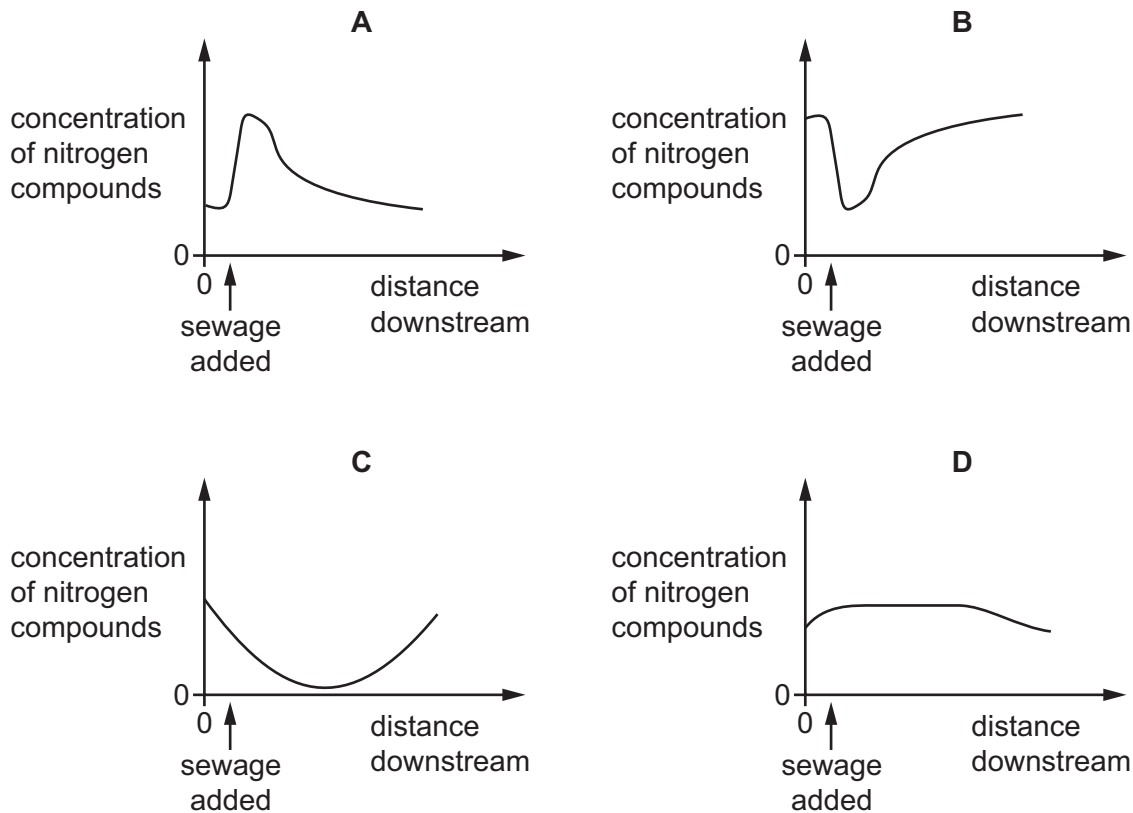
- A They convert nitrates to nitrites.
- B They convert nitrites to nitrates.
- C They release nitrogen gas from nitrates.
- D They use nitrogen gas to make nitrogen-containing compounds.

5 The diagram shows some stages in the nitrogen cycle.

Which arrow represents the action of nitrogen-fixing bacteria?



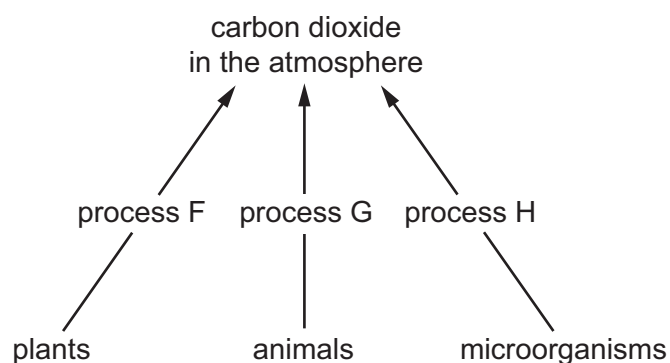
6 Which graph shows changes that occur in a river after being polluted by sewage?



7 In which natural cycles are protein molecules involved?

	carbon cycle	nitrogen cycle
A	✓	✓
B	✓	x
C	x	✓
D	x	x

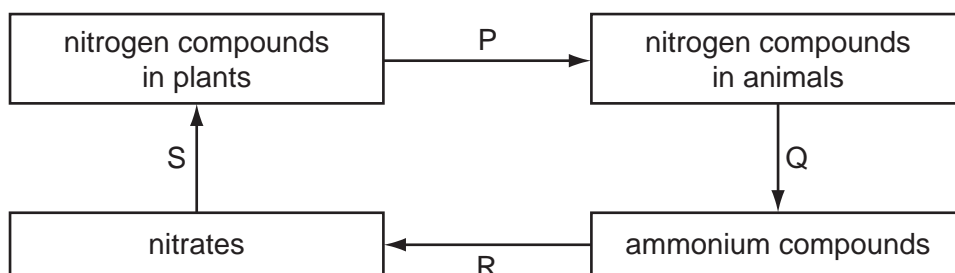
8 The diagram shows some of the stages in the carbon cycle.



What are processes F, G and H?

	process F	process G	process H
A	photosynthesis	respiration	photosynthesis
B	photosynthesis	respiration	respiration
C	respiration	respiration	respiration
D	respiration	photosynthesis	photosynthesis

9 The diagram shows part of the nitrogen cycle.

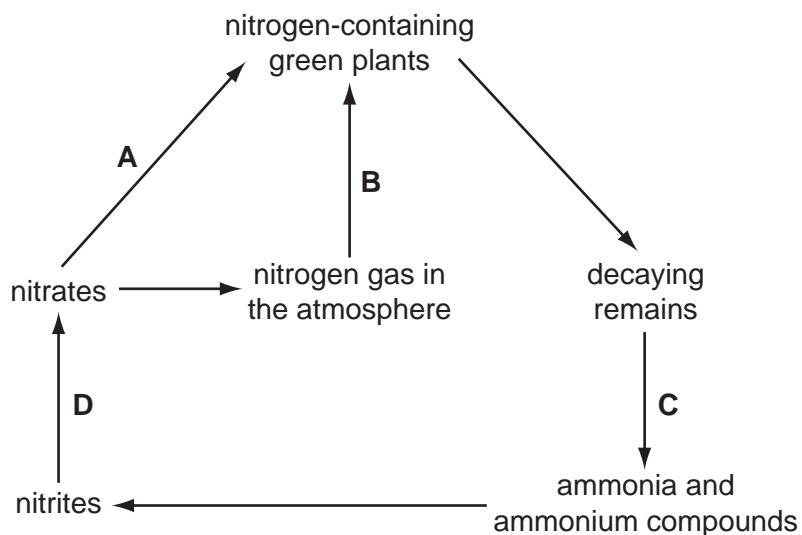


Which stages depend on bacteria?

- A P, Q, R and S
- B P and S only
- C Q and R only
- D R and S only

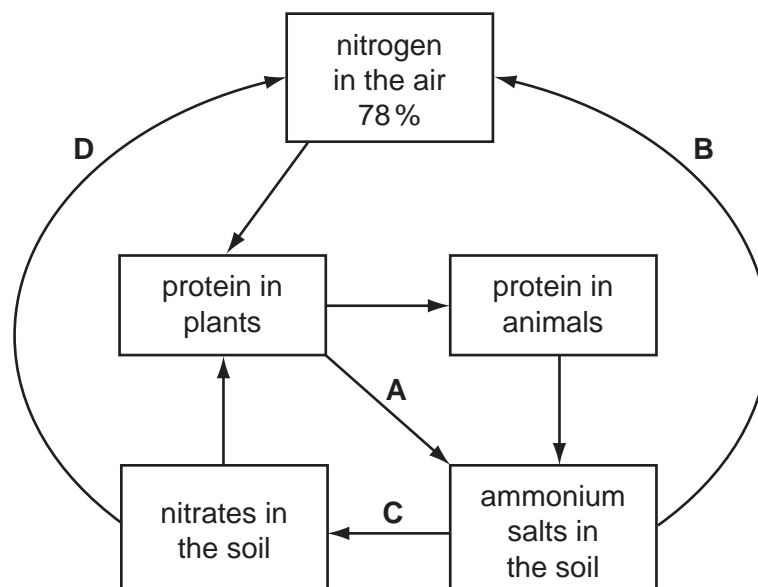
10 The diagram shows parts of the nitrogen cycle.

Which arrow represents the action of the root nodule bacteria of leguminous plants?



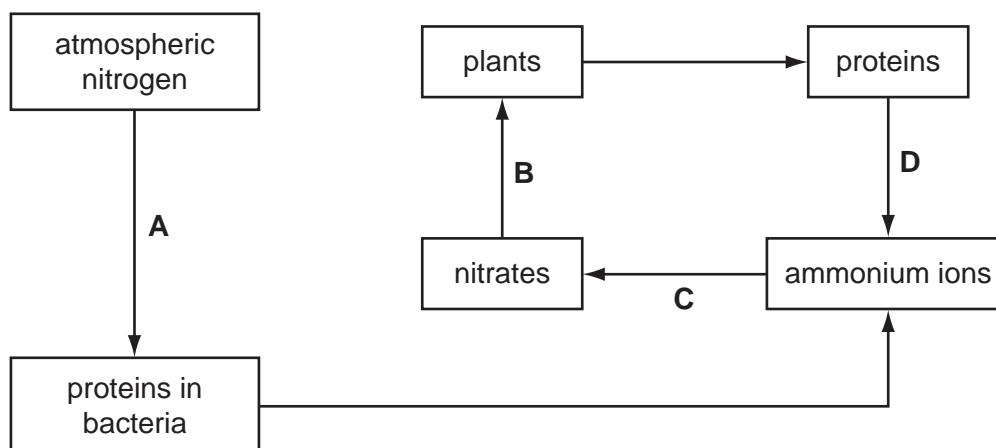
11 The diagram shows part of the nitrogen cycle.

At which stage do bacteria cause decomposition?



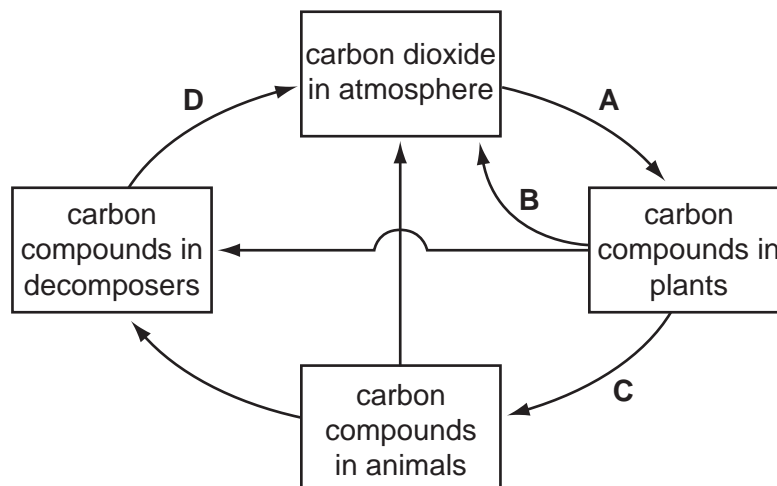
12 The diagram shows part of the nitrogen cycle.

Which process is carried out by decomposing bacteria?



13 The diagram shows part of the carbon cycle.

Which process causes the largest amount of carbon to be converted from one form to another?



14 The presence of high concentrations of nitrogen-containing fertilisers in a pond can lead to the death of fish.

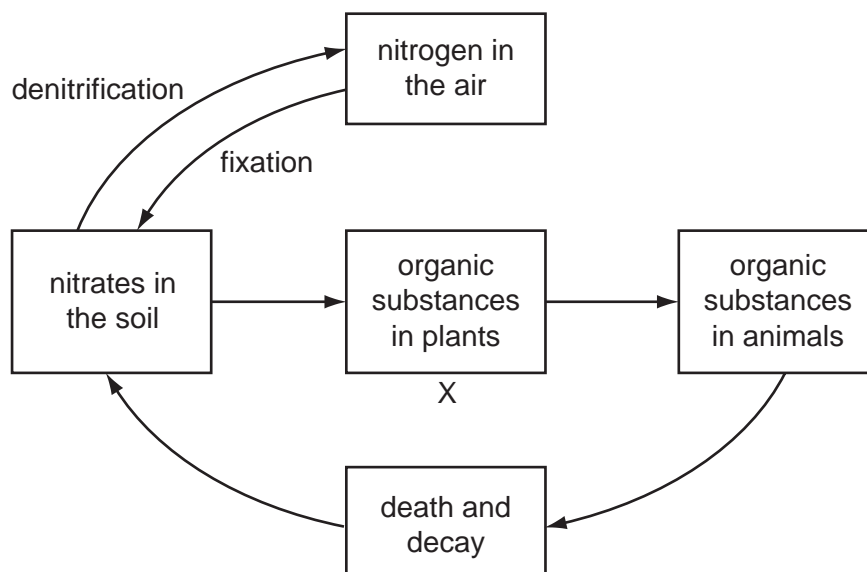
What is the sequence of events leading to the death of the fish?

- A** increase in algae → algae die → increase in bacteria → drop in oxygen
- B** increase in algae → drop in oxygen → increase in bacteria → algae die
- C** increase in bacteria → drop in oxygen → increase in algae → algae die
- D** increase in bacteria → increase in algae → algae die → drop in oxygen

15 Nitrogen is cycled in ecosystems. In what form is most of the nitrogen in animals?

- A** amino acid
- B** nitrogen gas
- C** proteins
- D** urea

16 The diagram shows part of the nitrogen cycle.



Which substance at X forms part of this cycle?

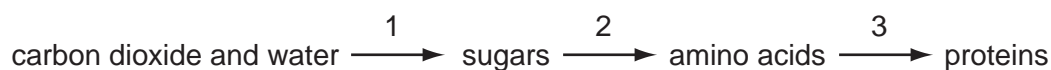
- A cellulose
 - B fat
 - C protein
 - D starch
- 17 Which bacteria convert urea to ammonia?
- A decay bacteria
 - B denitrifying bacteria
 - C nitrifying bacteria
 - D nitrogen-fixing bacteria
- 18 Nitrates in the soil can be absorbed by plants. Nitrates can also be removed from the soil by the action of
- A bacteria in the root nodules of legumes.
 - B denitrifying bacteria in poorly aerated conditions.
 - C nitrogen-fixing bacteria on ammonium compounds.
 - D nitrogen-fixing bacteria on decaying plants.

19 Lack of nitrate ions (NO_3^-) in flowering plants causes yellowing of leaves and poor growth whereas lack of magnesium ions (Mg^{2+}) causes yellowing between veins of leaves.

What explains these differences?

	Mg^{2+}		NO_3^-		
	involved in chlorophyll synthesis	involved in protein synthesis	involved in chlorophyll synthesis	involved in protein synthesis	
A	✓	x	✓	✓	key ✓ = true x = not true
B	✓	x	✓	x	
C	x	✓	x	✓	
D	x	✓	x	x	

20 The diagram shows some chemical reactions that occur in plants.

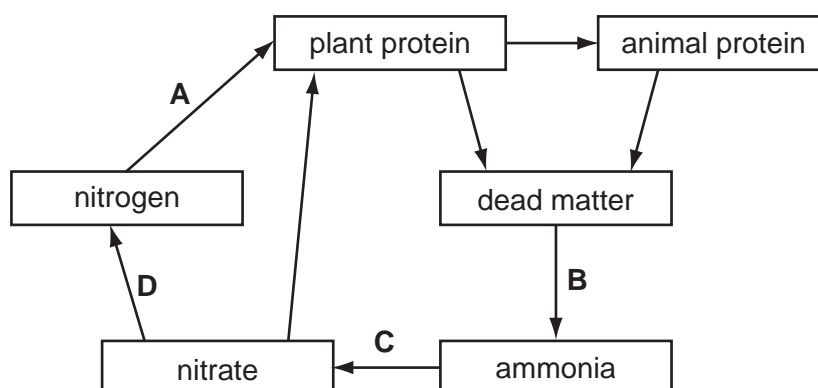


Which stage or stages depend on the use of nitrate ions as a raw material?

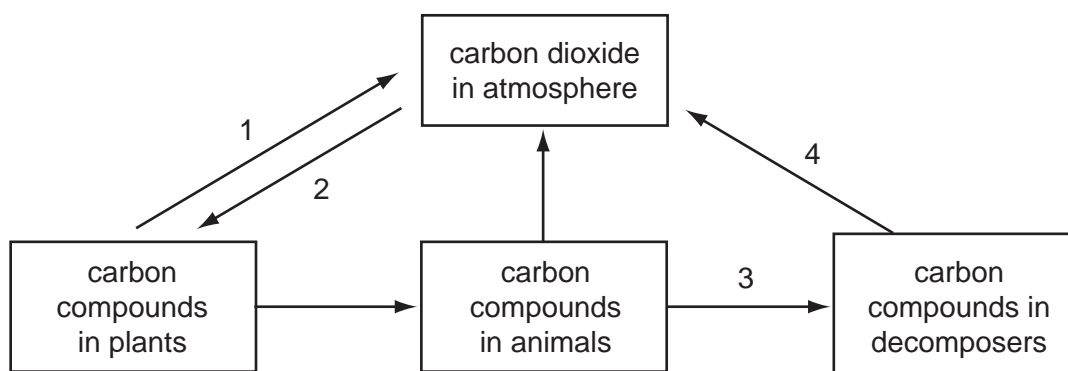
- A 1 only
- B 2 only
- C 1 and 3 only
- D 2 and 3 only

21 The diagram shows part of the nitrogen cycle.

Which stage depends on nitrifying bacteria?



22 The diagram shows part of the carbon cycle.



Which numbered arrows represent respiration?

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

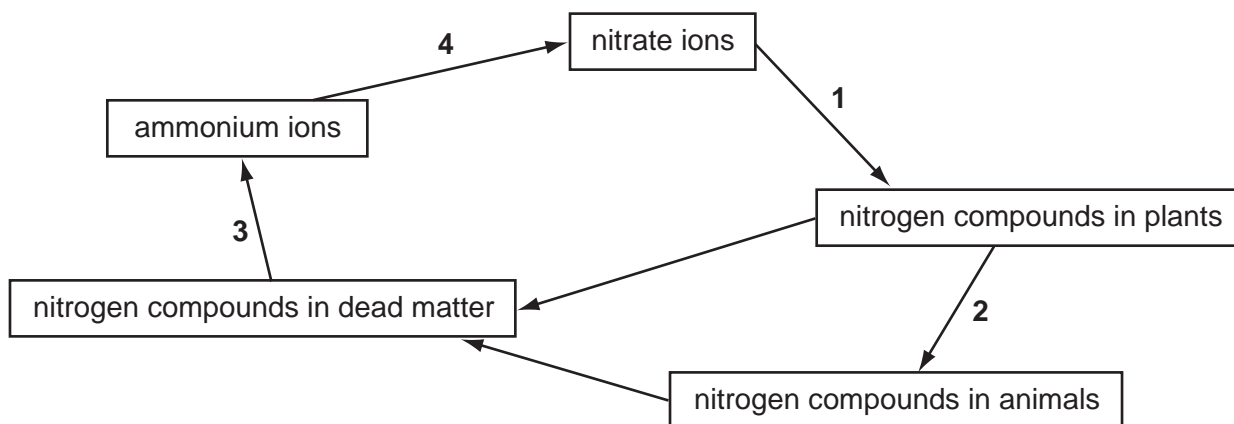
23 Which group of bacteria convert ammonia into nitrates in the nitrogen cycle?

- A** anaerobic bacteria
- B** denitrifying bacteria
- C** nitrifying bacteria
- D** nitrogen fixing bacteria

24 In the nitrogen cycle, which conversion processes can be carried out by animals, by bacteria and by plants?

	animals	bacteria	plants
A	nitrate to amino acids	protein to nitrogen gas	nitrite to nitrate
B	urea to protein	nitrogen gas to ammonia	amino acids to proteins
C	protein to urea	nitrite to nitrate	nitrate to amino acids
D	urea to ammonia	urea to protein	protein to nitrogen gas

25 The diagram shows part of the nitrogen cycle.



Which stages depend on the action of bacteria?

A 1 and 2

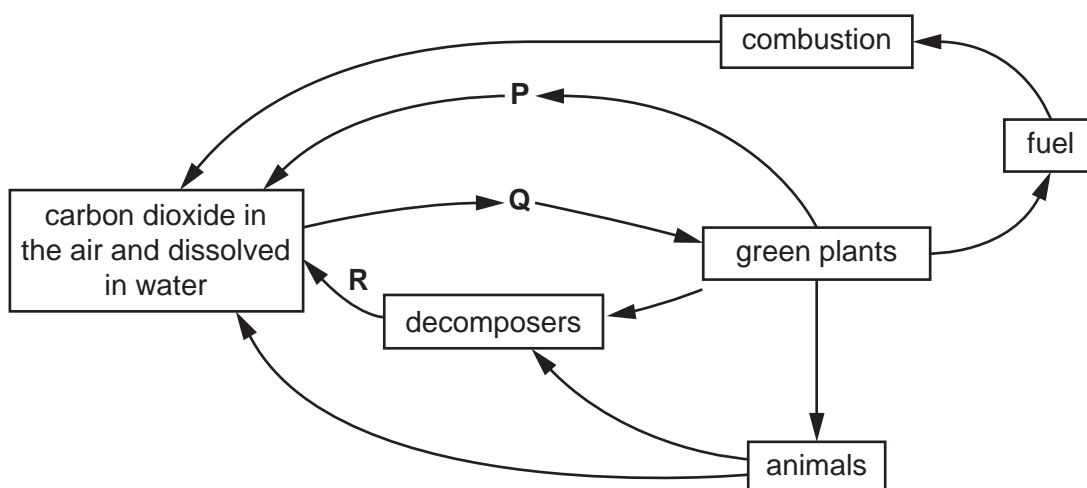
B 2 and 3

C 3 and 4

D 4 and 3

	P	Q	R
A	photosynthesis	photosynthesis	respiration
B	respiration	respiration	photosynthesis
C	photosynthesis	respiration	photosynthesis
D	respiration	photosynthesis	respiration

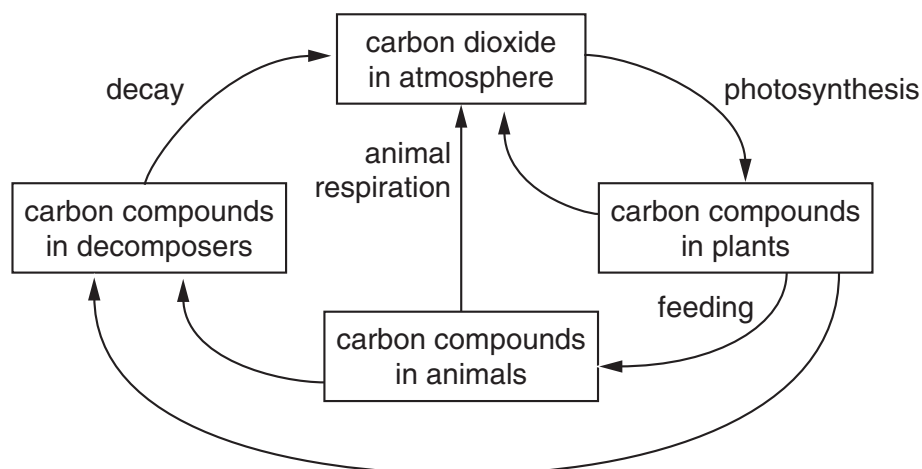
26 The diagram shows the carbon cycle.



What are processes P, Q, and R?

	P	Q	R
A	photosynthesis	photosynthesis	respiration
B	respiration	respiration	photosynthesis
C	photosynthesis	respiration	photosynthesis
D	respiration	photosynthesis	respiration

27 The diagram shows part of the carbon cycle.



Which process converts most carbon from one form to another?

- A animal respiration
 - B decay
 - C feeding
 - D photosynthesis
- 28 Which is the most direct way that the carbon in starch stored in cereal grain can return to the atmosphere as carbon dioxide?
- A Grain is destroyed by fire during storage.
 - B Grain is eaten by birds.
 - C Grain is made into bread and eaten by humans.
 - D Grain stored in damp conditions goes mouldy and decay.

29 Which processes occur during the carbon cycle?

	carbon compounds absorbed by living organisms	carbon compounds excreted by living organisms
A	yes	yes
B	yes	no
C	no	yes
D	no	no