



National 5

Unit 3

Life on earth

Ink exercise 2

Energy in ecosystems

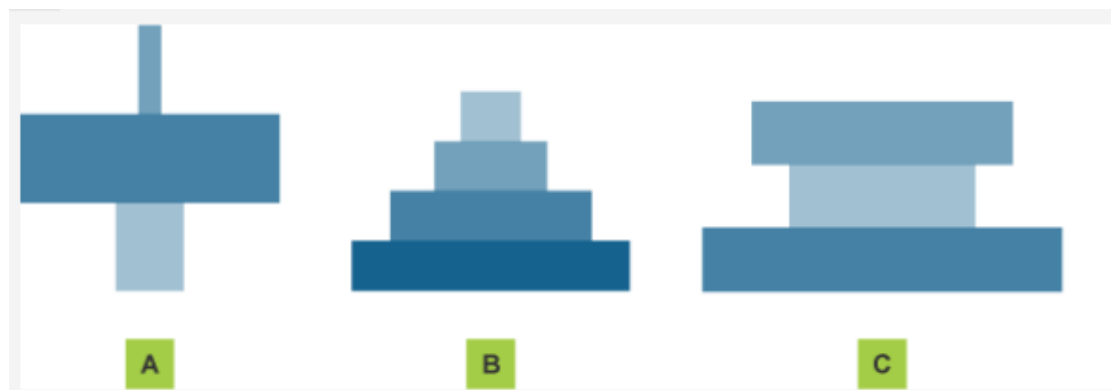
Once completed and marked-

Think about and list below the areas I need to work on

Multiple choice

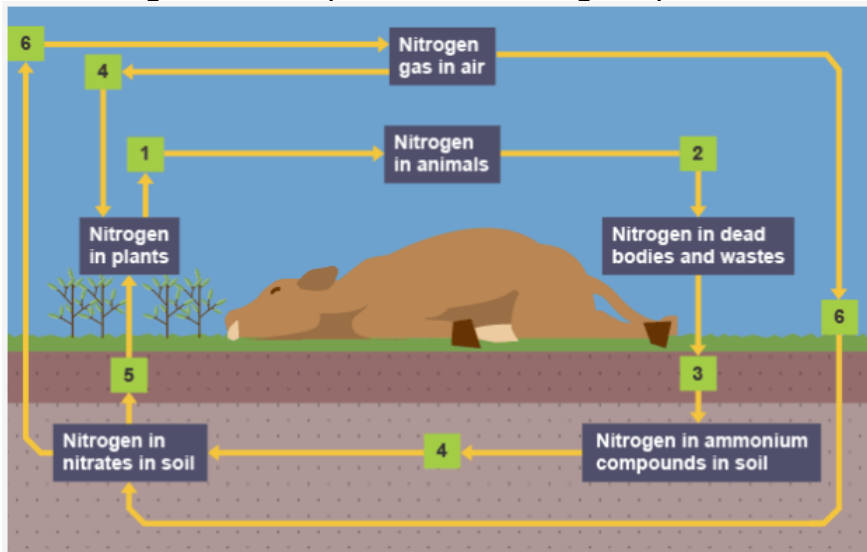
Tick one answer from each question.

1. Which of the following statements about energy transfer in a food chain is correct?
 - a) All of the energy is transferred along a food chain - none of the energy is lost
 - b) Most of the energy is transferred along a food chain - only a small amount of the energy is lost
 - c) Only a little of the energy is transferred along a food chain - most of the energy is lost
2. What do you call a diagram that shows the population sizes of organisms at each level of a food chain?
 - a) A pyramid of numbers
 - b) A pyramid of biomass
 - c) A pyramid of energy
3. Three pyramid of numbers are shown
Which pyramid is most likely to have a tree as a producer?



- a) A
 - b) B
 - c) C
4. What do plants use nitrate for?
 - a) To produce sugars
 - b) To produce proteins
 - c) To produce fats

5. The diagram shows part of the nitrogen cycle.



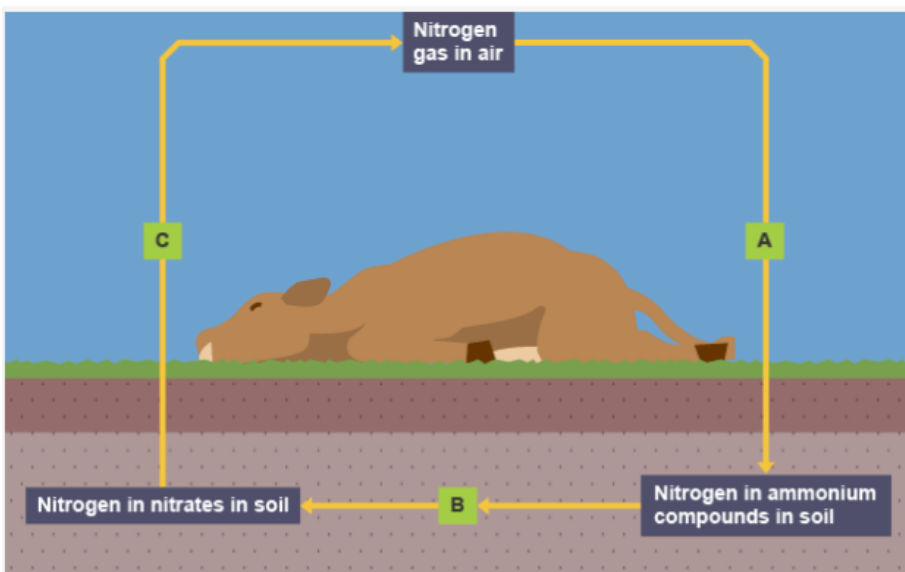
Which of the numbered stages involve bacteria?

- a) 1 and 3
- b) 2 and 4
- c) 3 and 4

6. Which reaction shown below is carried out by denitrifying bacteria?

- a) Ammonium \rightarrow nitrate
- b) Nitrate \rightarrow nitrogen gas
- c) Nitrogen gas \rightarrow ammonium

7. The diagram shows part of the nitrogen cycle.



Which process is nitrification?

- a) A
- b) B
- c) C

8. In which of the following options can competition occur?

- a) Between two organisms that are attempting to use different resources that are in short supply
- b) Between two organisms that are attempting to use the same resource that is in short supply
- c) Between two organisms that are attempting to use the same resource that is in limitless supply

9. Which of the following do plants usually compete for?

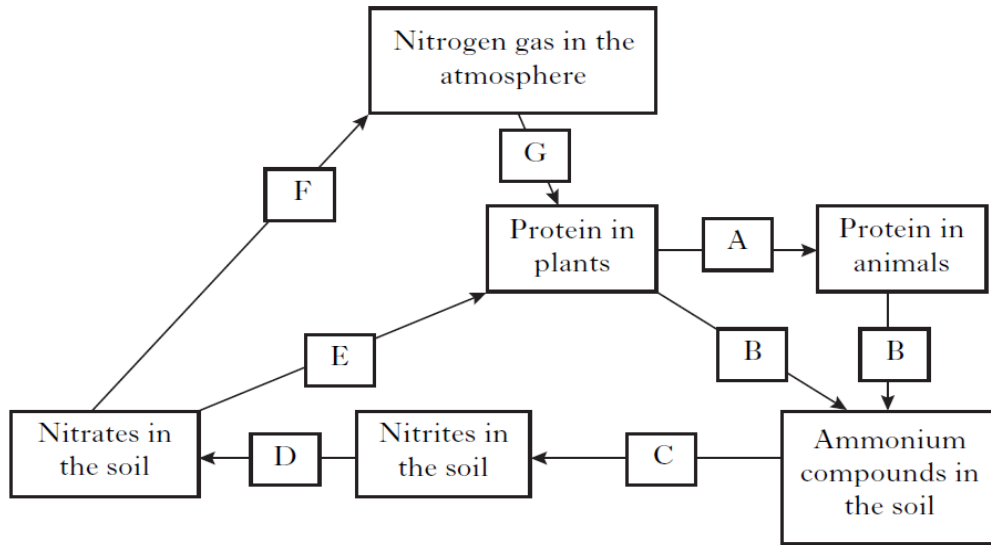
- a) Light only
- b) Light and soil nutrients
- c) Light, soil nutrients and carbon dioxide

10. In which of the following options does interspecific competition occur?

- a) Between organisms of different species that are attempting to use different resources in an ecosystem
- b) Between organisms of different species that are attempting to use the same resource in an ecosystem
- c) Between organisms of the same species that are attempting to use the same resource in an ecosystem

11.

The diagram below represents part of the nitrogen cycle.



- (a) (i) Use letters from the diagram to identify the following.
Each letter may be used once, more than once or not at all.

Decay of dead material	<input type="text"/>
Nitrification	<input type="text"/> <input type="text"/>
Nitrogen fixing	<input type="text"/>

2

- (ii) Which type of organism is responsible for process D?

1

- (b) In an investigation, wild rabbits were found to eat an average of 600 g of grass per day. This grass contains 450 g of water. The dry weight of the grass contains 20% protein.

Calculate how much protein a rabbit eats per day.

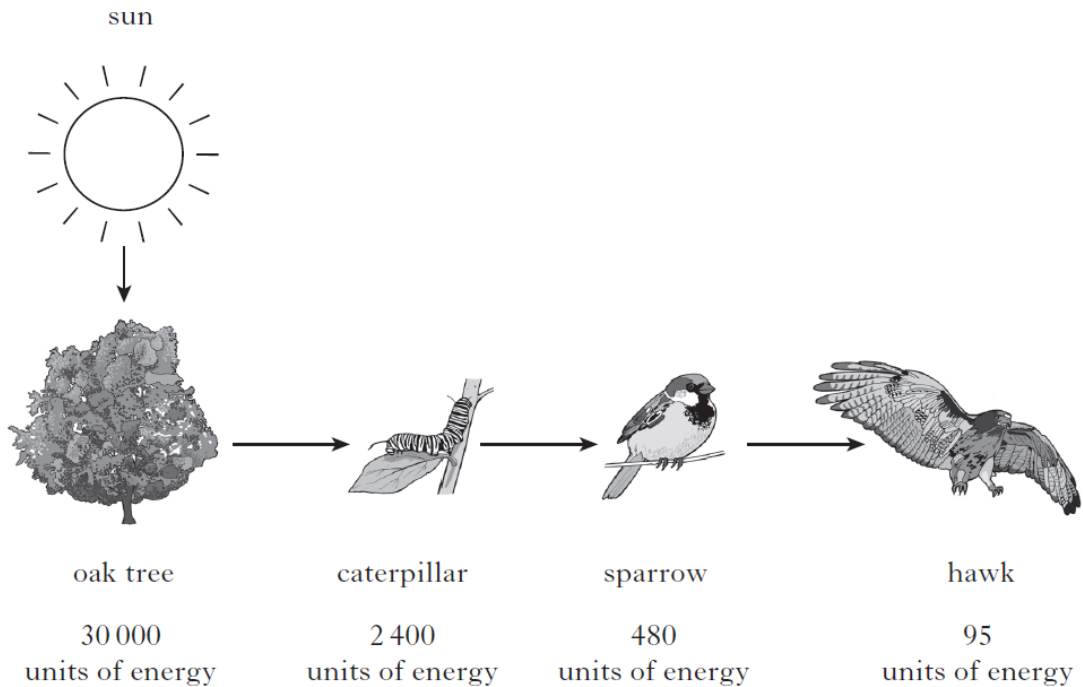
Space for calculation

Answer _____ g

1

12.

The diagram below shows the transfer of energy through a food chain in a wood. The numbers represent the units of energy in the different populations of the food chain.



(a) (i) Complete the table below using information from the diagram.

<i>Population</i>	<i>Energy content (units)</i>
oak tree	30 000
caterpillar	2 400
sparrow	480
hawk	95

2

(ii) 4% of the light energy reaching the oak tree is converted into new plant material.

How much energy did the oak tree receive?

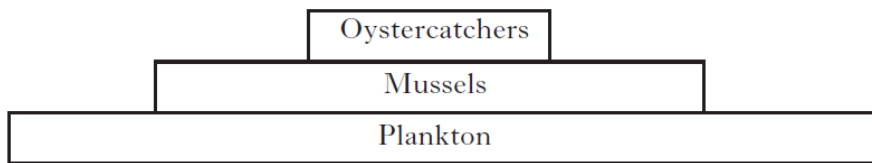
Space for calculation

_____ units

1

(iii)

A pyramid of biomass, including mussels, is shown below.



Explain what is meant by a pyramid of biomass.

1

13.a. Under what conditions does competition between organisms occur?

1

b. Name two resources for which:

i) plants and

ii) animals could be competing

4

14.a Explain the difference between intraspecific and interspecific competition

1

b. Explain why competition between members of the same species is likely to be more intense than that between members of two different species.

1

25 marks

