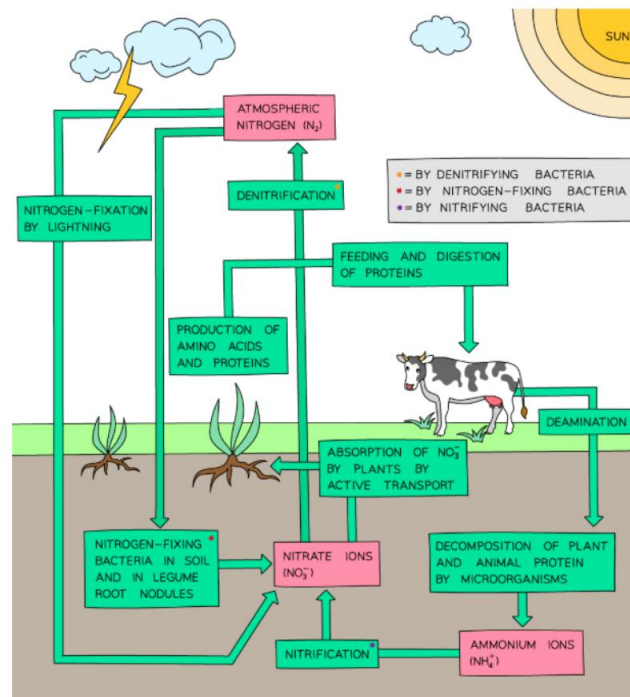


Model Answers: Hard

Q1

The correct answer is **C** because the process of **denitrification** removes **nitrates** from the soil, releasing it back into the atmosphere as **nitrogen gas**.

This process occurs naturally by **denitrifying** bacteria in the soil, and it reduces soil fertility.



A is incorrect as	this arrow shows decomposition of animals into ammonium compounds.
B is incorrect as	this arrow refers to nitrification which is carried out by nitrifying bacteria.
D is incorrect as	this arrow depicts nitrogen fixation by bacteria in root nodules and lightning .

Q2

The correct answer is **B** because:

- **Energy** from the sun is trapped by **chlorophyll**, the pigment found in chloroplasts.
- Light **energy** is then used to drive the synthesis of **carbohydrates** such as glucose (a sugar); in this sense an energy transfer occurs from light to chemical potential energy within the bonds of carbohydrate molecules.
- The sugars produced in **photosynthesis** are then stored as more complex molecules such as **starch** in the plant.

Q3

The correct answer is **A** because:

- As the **carnivores** have less food available the numbers will reduce over time.
- The reduction in numbers will be rapid as shown in graph A.

B is incorrect as	this graph shows a gentle decline in the numbers of carnivores over time. The decline has also started before point X on the graph.
C & D are incorrect as	both graphs show the numbers of carnivores increasing after point X.

Q4

The correct answer is **C** because the exponential (log) phase in a population growth curve is when there is rapid growth of a population.

A is incorrect as	the stationary phase on the graph would show neither an increase or decrease in numbers in the population.
B is incorrect as	the lag phase is when the population is growing slowly and adjusting to new conditions.
D is incorrect as	the death phase .on a graph would show the decline of the population with the line decreasing. This is not yet seen in the human population.