

Question 34 (Answer: **A**)

- Excess amino acids cannot be stored, so the amino group must be removed.
- Removing that amino group is deamination, which happens in the liver.
- Decomposition and denitrification are done by soil microorganisms, not inside a living animal.

Question 35 (Answer: **D**)

- Photosynthesis removes carbon dioxide from the air and fixes it into plant material.
- So the arrow must point *from* atmospheric carbon dioxide *to* the plants.
- Arrows going the other way are respiration, combustion or decomposition.

Question 36 (Answer: **A**)

- Decomposers break down the protein in dead material and waste.
- Their action releases the nitrogen as ammonium ions.
- Nitrification then turns ammonium into nitrate, and nitrogen fixation works on nitrogen *gas*.

Question 35 (Answer: **C**)

- Photosynthesis takes carbon dioxide out of the air and fixes it into carbohydrate.
- Respiration, combustion and decomposition all *release* carbon dioxide.
- So photosynthesis is the only one of the four that removes it.

Question 36 (Answer: **D**)

- Follow the arrows and name each step by what it converts.
- Nitrogen fixation goes from nitrogen gas to a compound; nitrification from ammonia to nitrate.
- Denitrification runs the other way, converting nitrate back to nitrogen gas.

3(a)(i)	A denitrification ; B nitrification ;
3(a)(ii)	<i>any two from:</i> lightning ; bacteria ; AVP ;
3(a)(iii)	ammonia / ammonium (ions) ;
3(a)(iv)	liver ;
3(a)(v)	removal of nitrogen containing part (of amino acids / protein) ; urea is formed ;
3(b)	greenhouse effect ; rice ; carbon dioxide ; photosynthesis ; burning / combustion ;
3(c)	<i>any six from:</i> 1 untreated sewage / fertiliser / nutrients ; 2 increased availability of nitrates / ions / AW ; 3 causing algal bloom / algae reproduction ; 4 algae reduce (penetration of) sunlight (in the water) / AW ; 5 (so rooted) plants unable to photosynthesise ; 6 so plants die ; 7 bacteria, decompose / feed, on dead, plants or algae ; 8 so bacterial populations increase ; 9 bacteria respire aerobically ; 10 bacteria use up the oxygen in the water ; 11 organisms / fish , die / suffocate / migrate, due to lack of oxygen ;

Question 37 (Answer: **C**)

- Nitrogen gas is unusable by most organisms, so it must first be combined into a compound.
- The step turning nitrogen gas into ammonium ions is nitrogen fixation.
- Nitrification converts ammonium to nitrate, and denitrification runs the other way, back to nitrogen gas.

Question 37 (Answer: **D**)

- Nitrogen fixation converts nitrogen *gas* into a usable compound.
- Lightning provides enough energy to combine nitrogen and oxygen in the air.
- Nitrogen-fixing bacteria in root nodules do the same thing biologically.

Question 35 (Answer: **B**)

- Carbon dioxide rises when it is released faster than it is taken up.
- Deforestation removes trees that would absorb it, and burning more fossil fuel releases more.
- Planting trees and burning less fuel both *reduce* it, so those two do not belong.