

**Paper Reference(s) 9BI0/02**  
**Pearson Edexcel Level 3 GCE**

## **Biology B**

**Advanced**

**PAPER 2: Advanced Physiology, Evolution and Ecology**

**Friday 16 June 2023 – Morning**

## **Diagram Booklet**

**In the boxes below, write your name, centre number and candidate number.**

<b>Surname</b>					
<b>Other names</b>					
<b>Centre Number</b>					
<b>Candidate Number</b>					

## **INSTRUCTIONS**

**There may be spare copies of some diagrams in case you need them.**

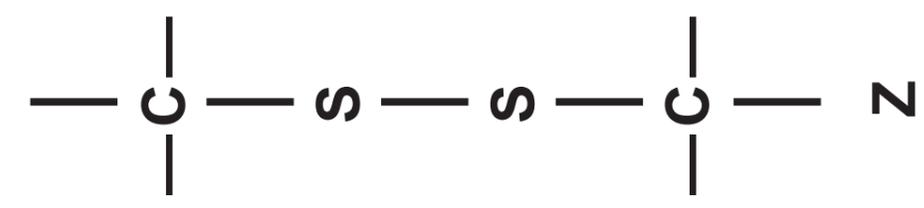
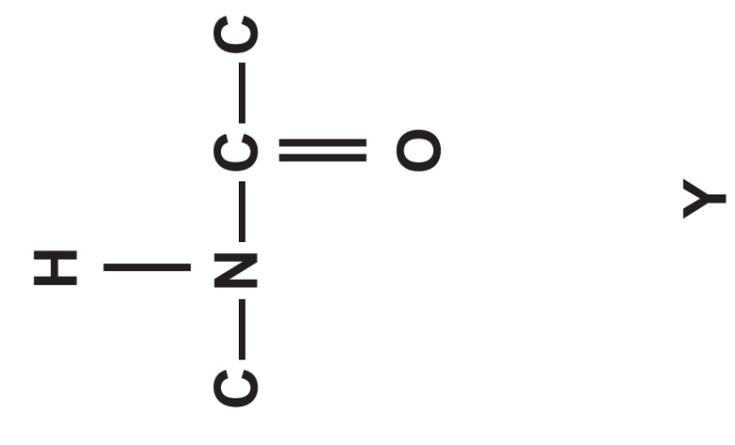
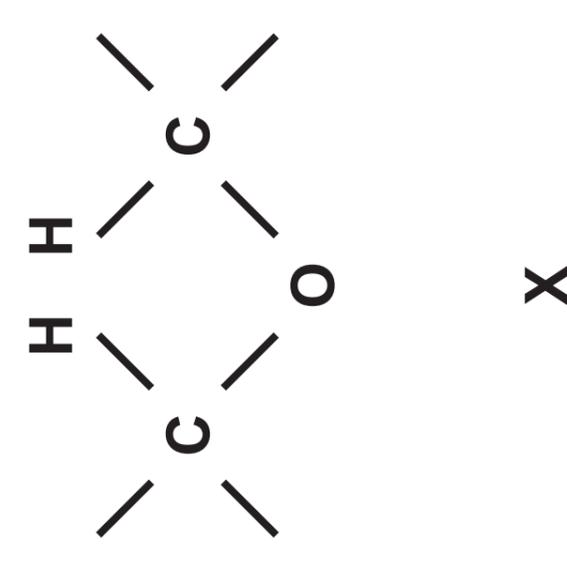
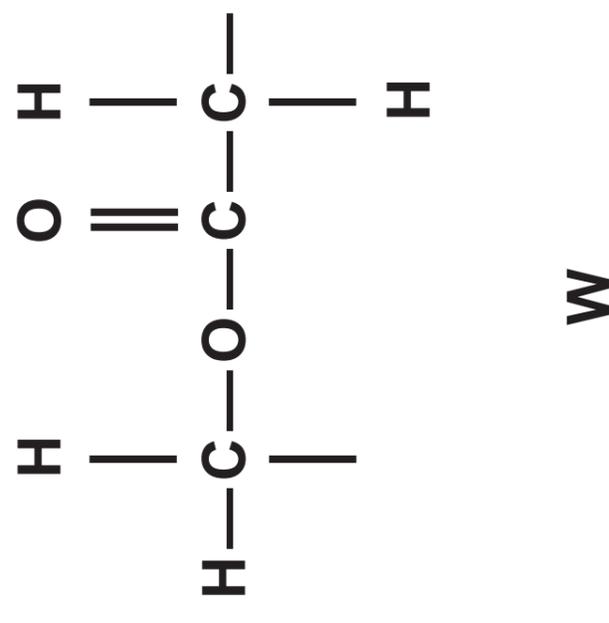
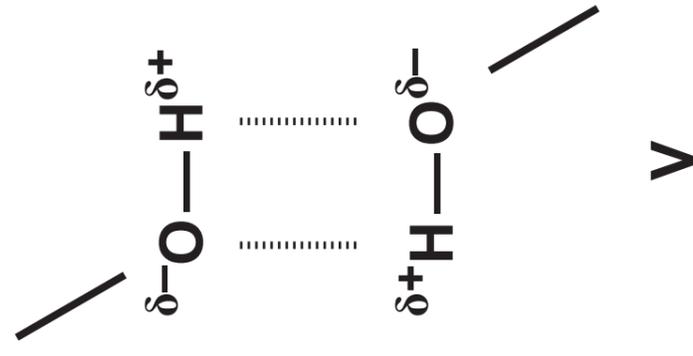
**THIS DIAGRAM BOOKLET MUST BE RETURNED WITH THE QUESTION PAPER AT THE END OF THE EXAMINATION.**

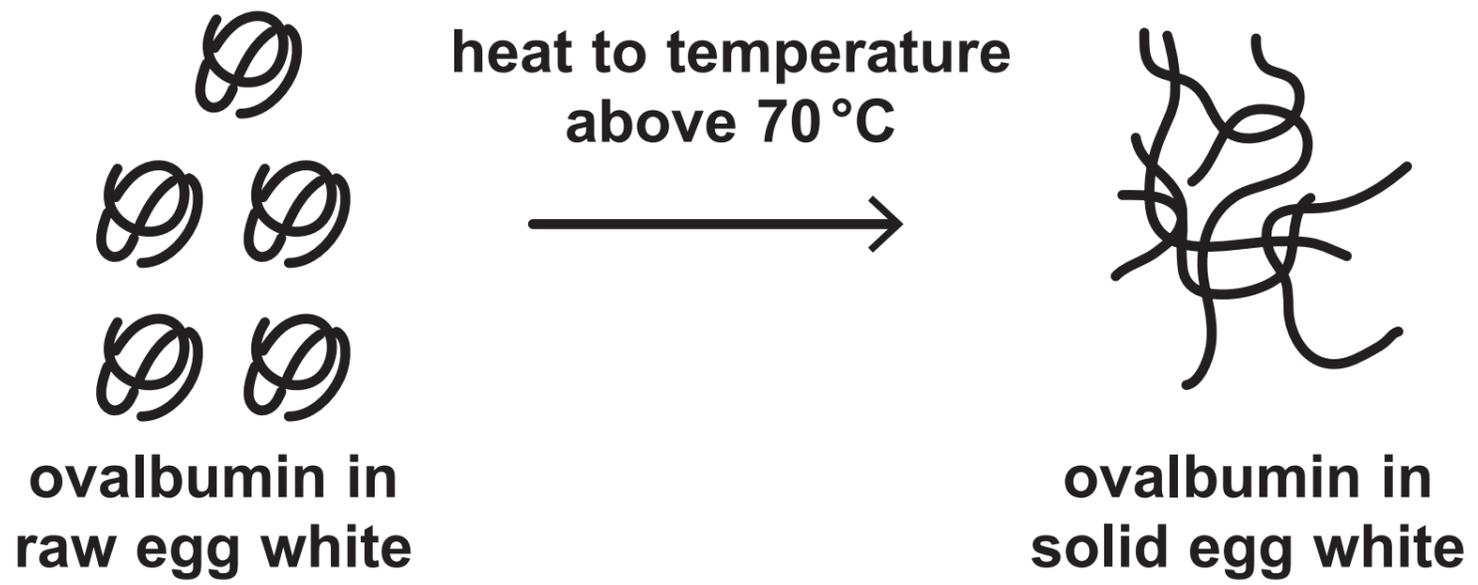
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Question 1(a)



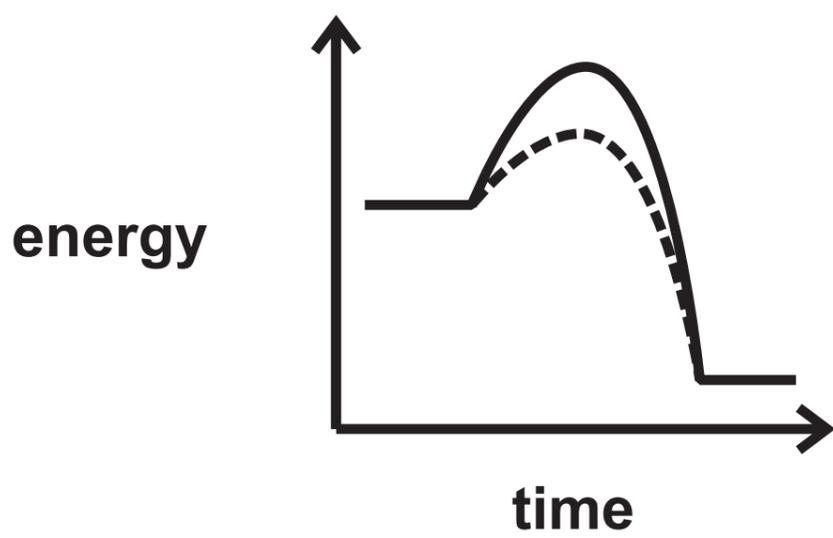
**Question 1(b)**

## Question 2(a)

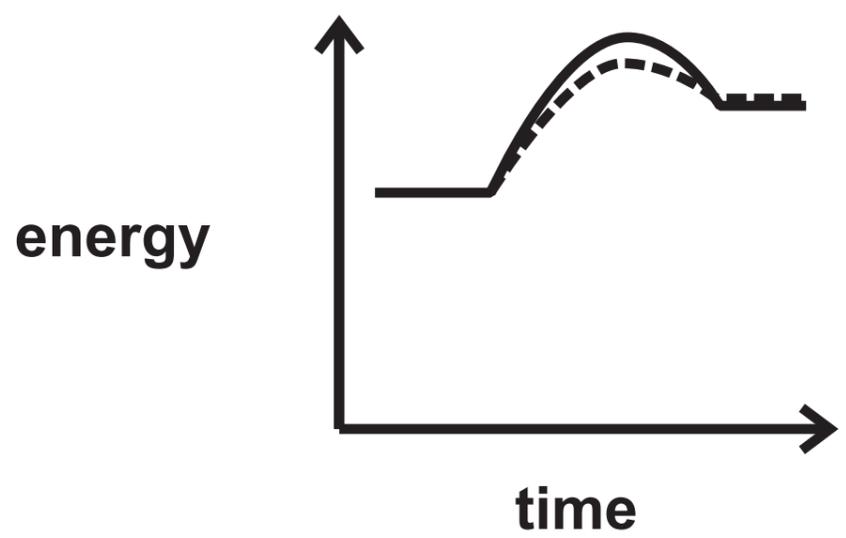
## Key:

— without enzyme

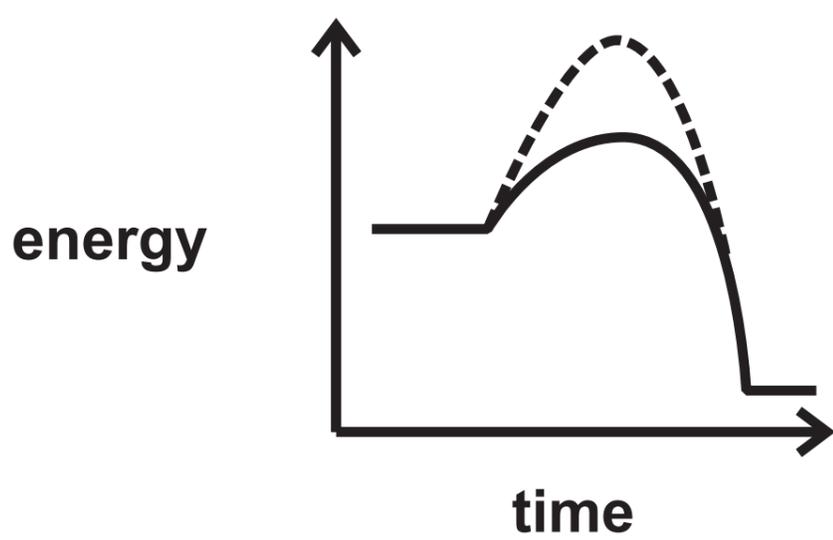
- - - - with enzyme



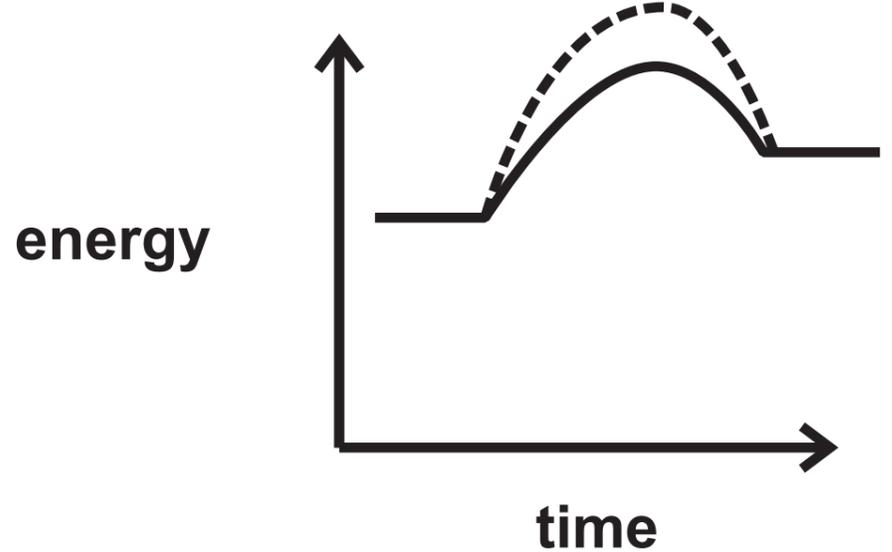
W



X



Y

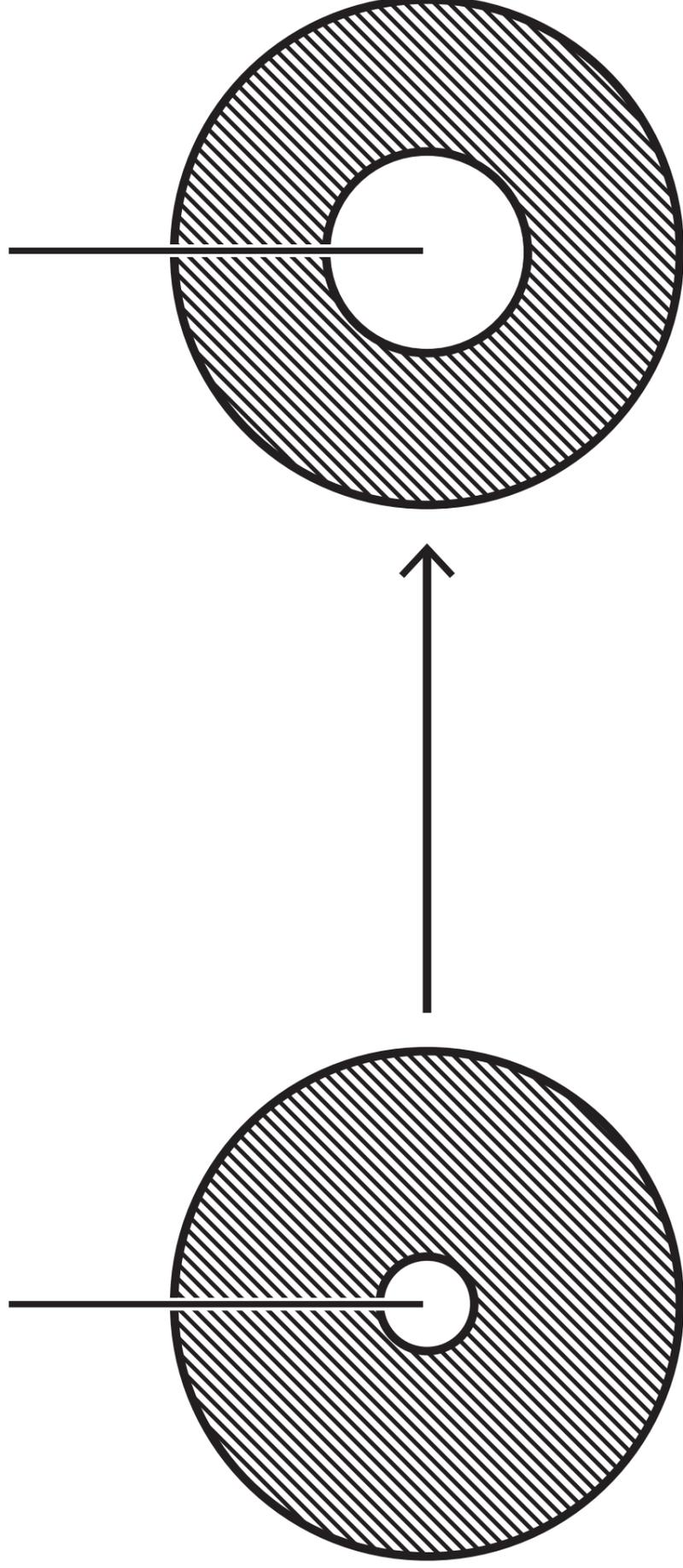


Z

Question 2(b)

area of gelatine that has been digested

well



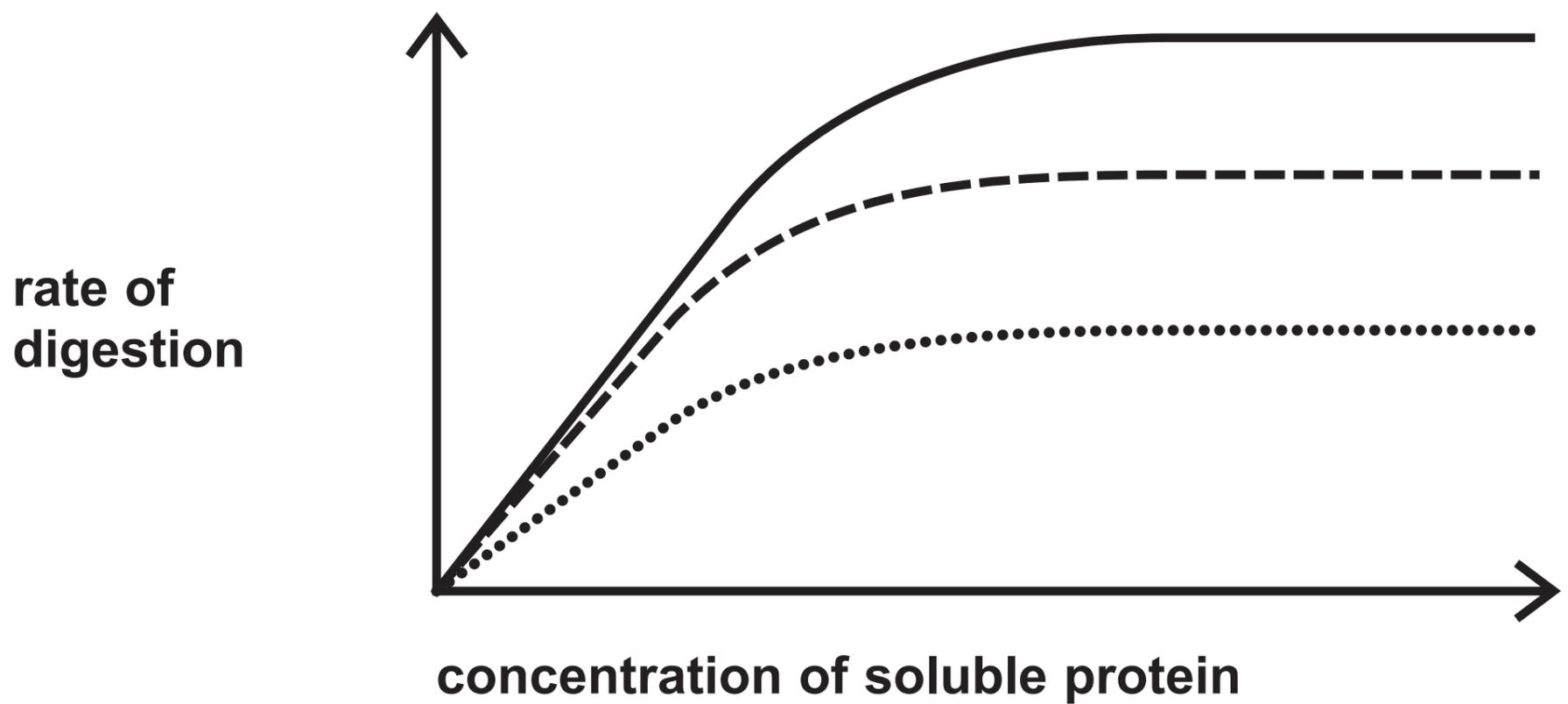
## Question 2(c)

## Key

———— no copper sulfate

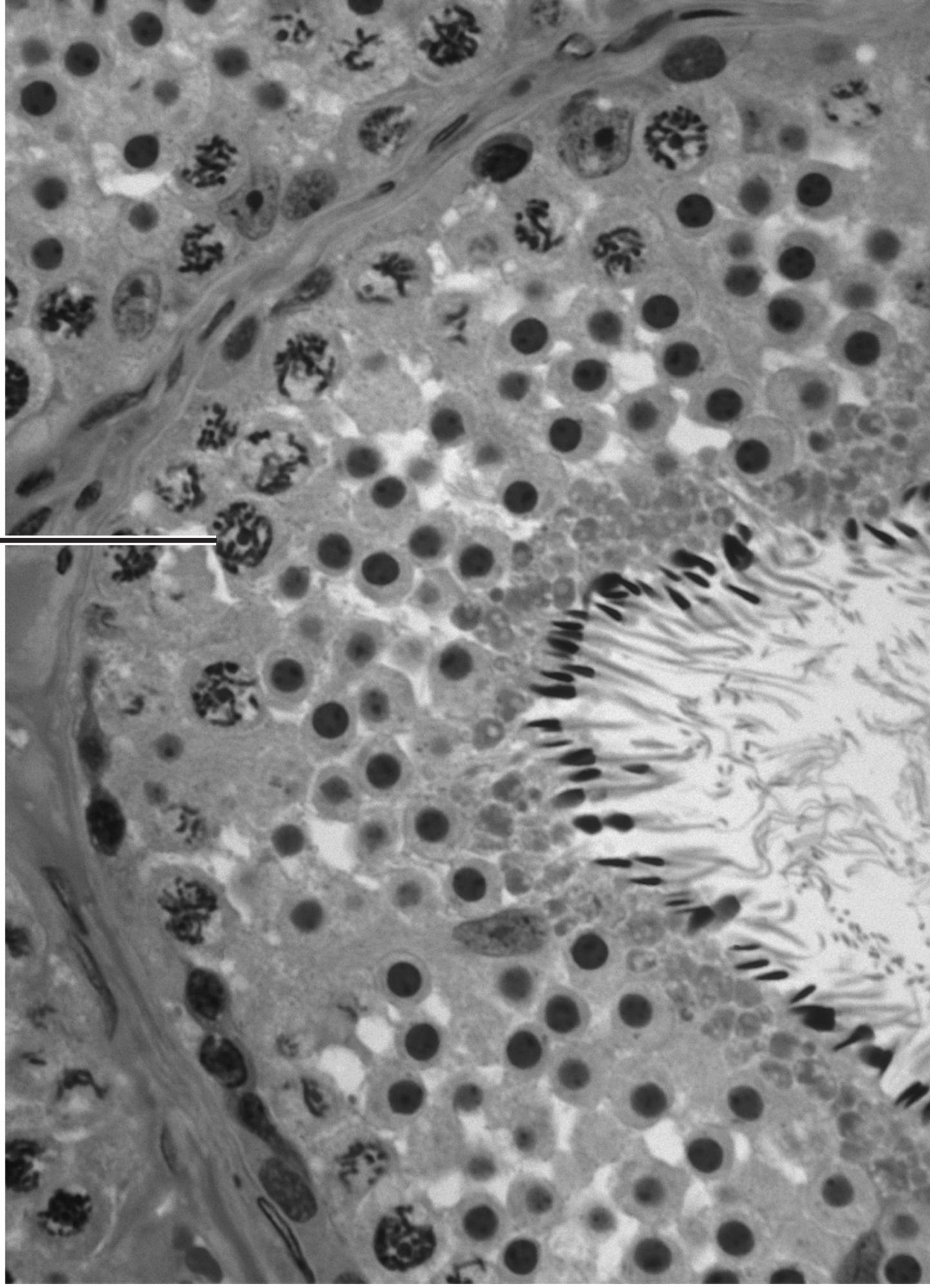
----- medium concentration of  
copper sulfate

..... high concentration of  
copper sulfate



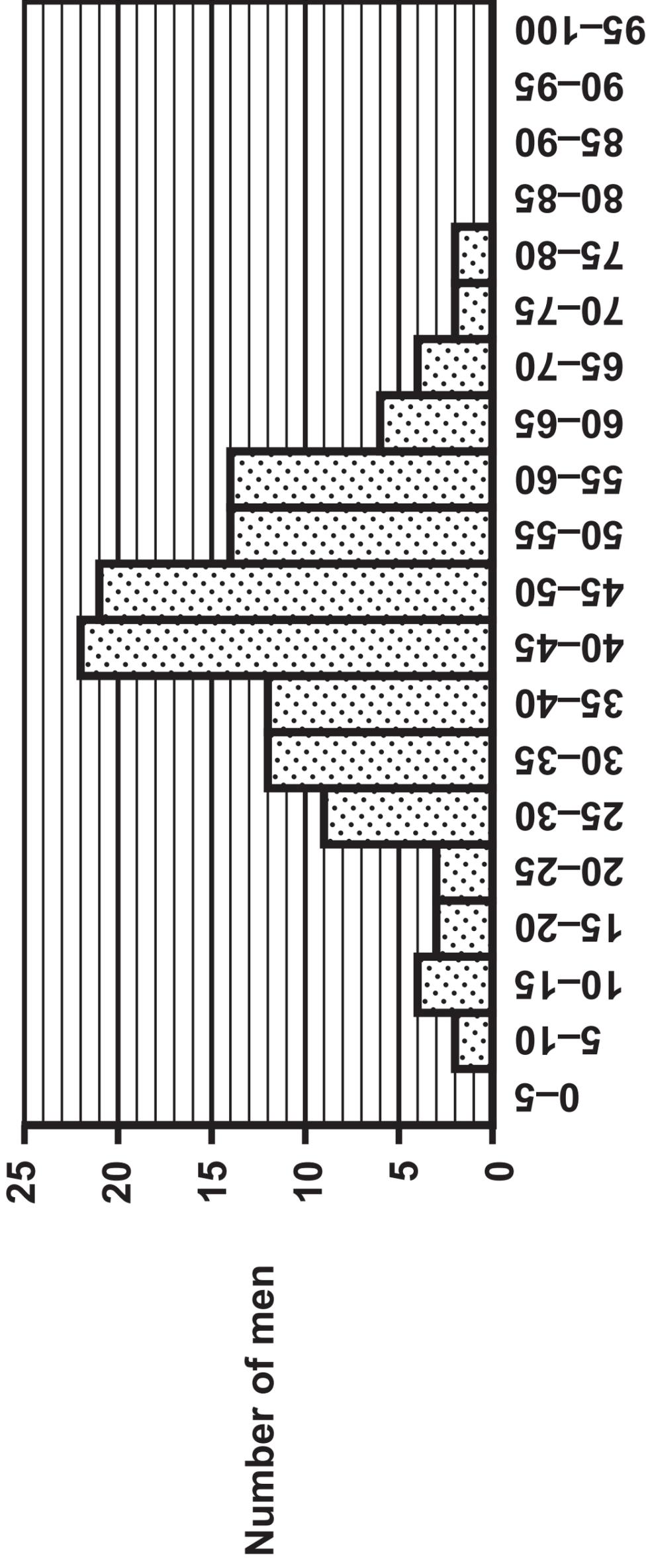
Question 3(a)

X



**Question 3(b)**

**Men with partners with history of pregnancies not developing to full term**

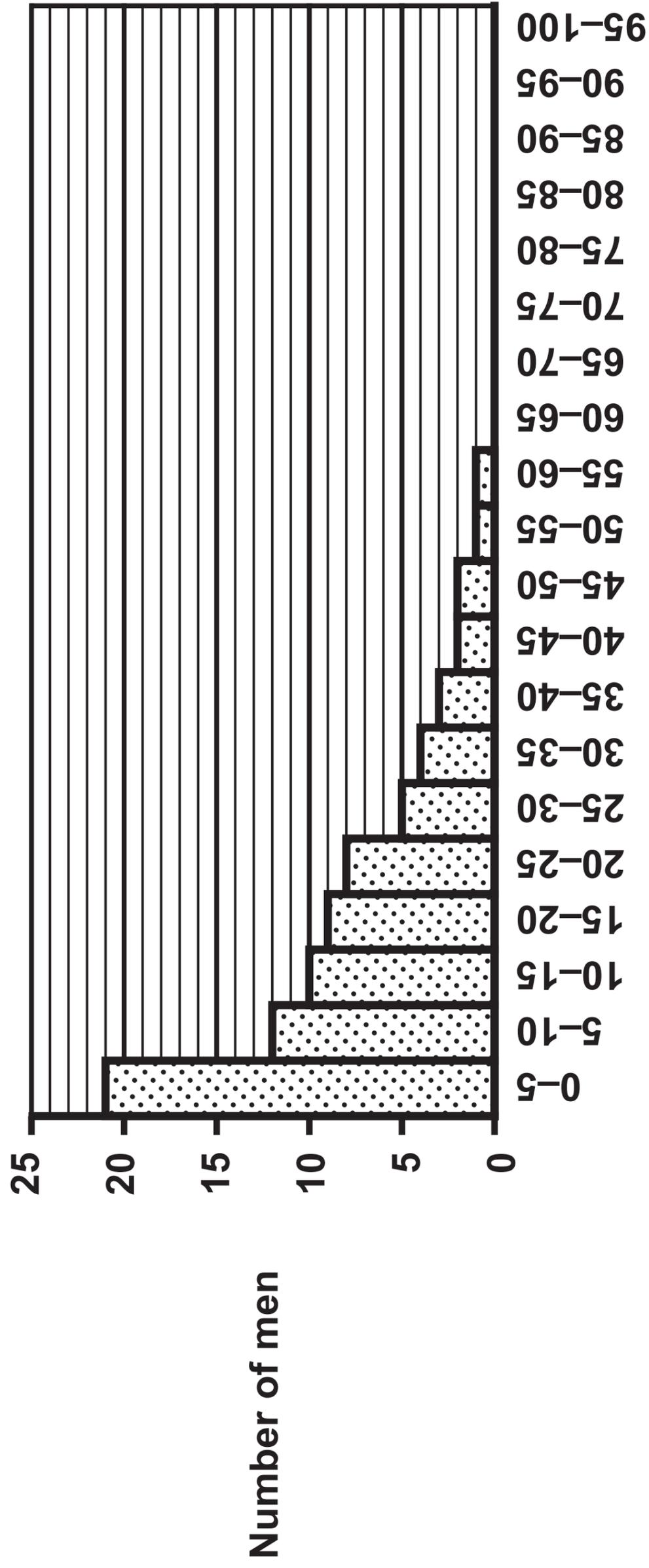


**Percentage (%) of sperm cells with DNA damage**

**(continued on the next page)**

Question 3(b) continued.

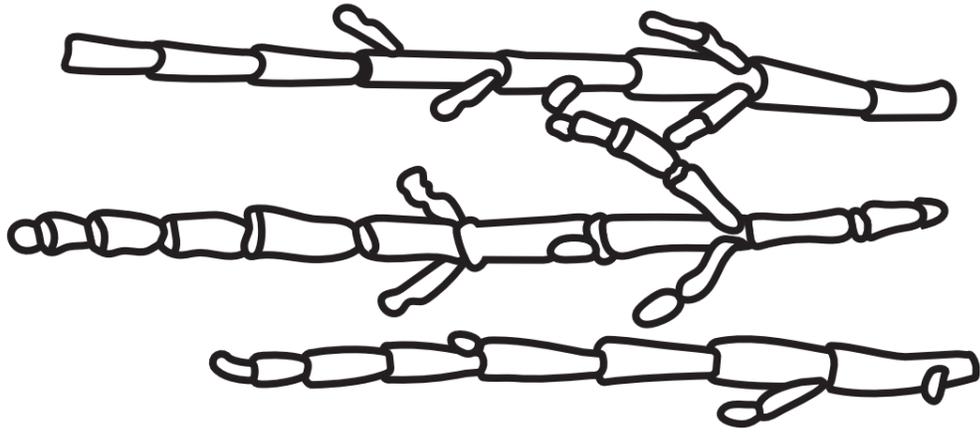
Men with partners where pregnancies developed to full term



Percentage (%) of sperm cells with DNA damage

Question 4(a)



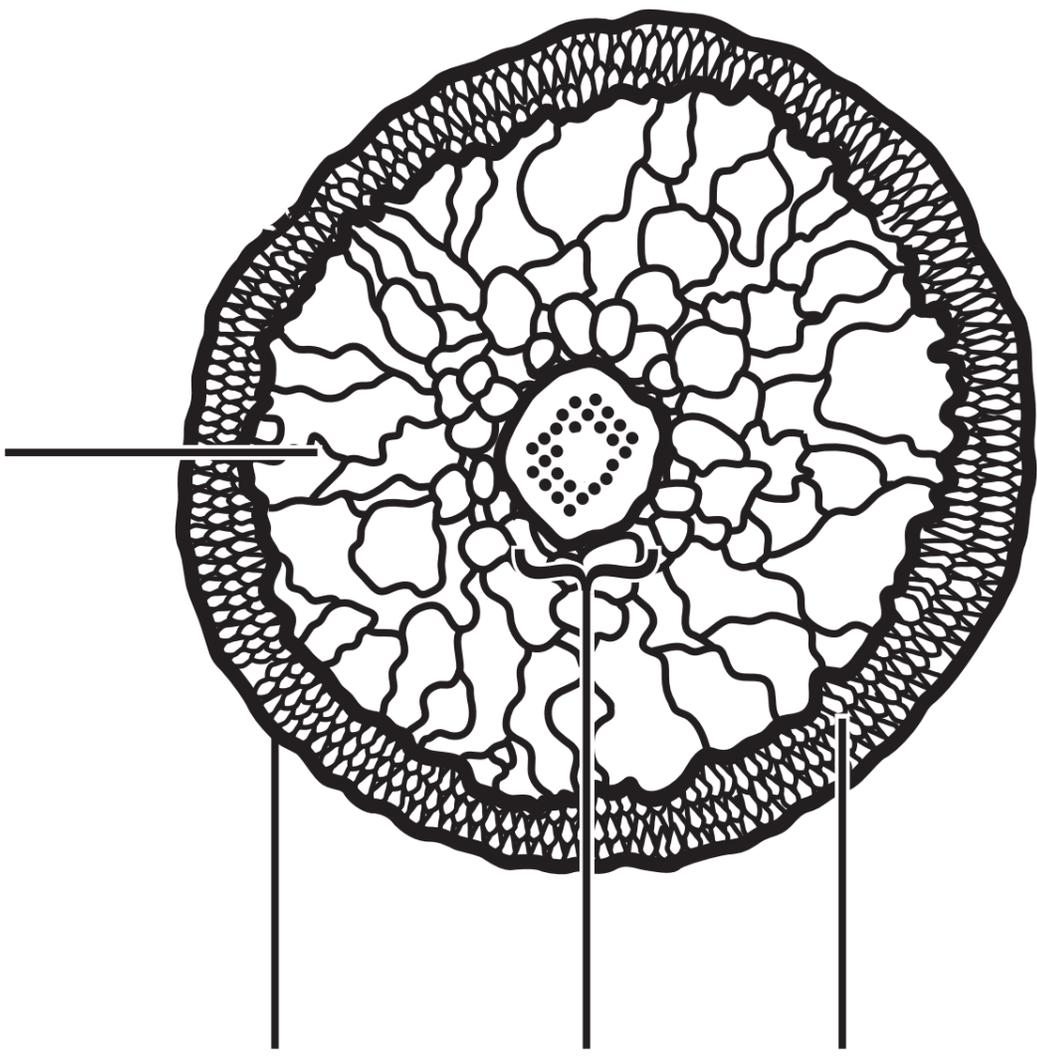


**cortex containing large cells with high salt concentration and air spaces**

**thick epidermis and waxy cuticle**

**vascular tissue**

**palisade cells containing chloroplasts**



**Question 4(b)**

<b>Factor</b>	<b>Distance from sea / m</b>				
	<b>0</b>	<b>5</b>	<b>10</b>	<b>15</b>	<b>20</b>
<b>Samphire</b>	<b>Abundant</b>	<b>Common</b>	<b>Rare</b>	<b>Absent</b>	<b>Absent</b>
<b>Sea lavender</b>	<b>Absent</b>	<b>Rare</b>	<b>Common</b>	<b>Common</b>	<b>Rare</b>
<b>Scurvy grass</b>	<b>Absent</b>	<b>Absent</b>	<b>Rare</b>	<b>Occasional</b>	<b>Abundant</b>
<b>Index of diversity for all plant species</b>	<b>0-20</b>	<b>0-54</b>	<b>0-85</b>	<b>2-54</b>	<b>2-85</b>
<b>Percentage of silt made up of organic material (%)</b>	<b>15</b>	<b>10</b>	<b>25</b>	<b>35</b>	<b>55</b>

## Question 5(b)

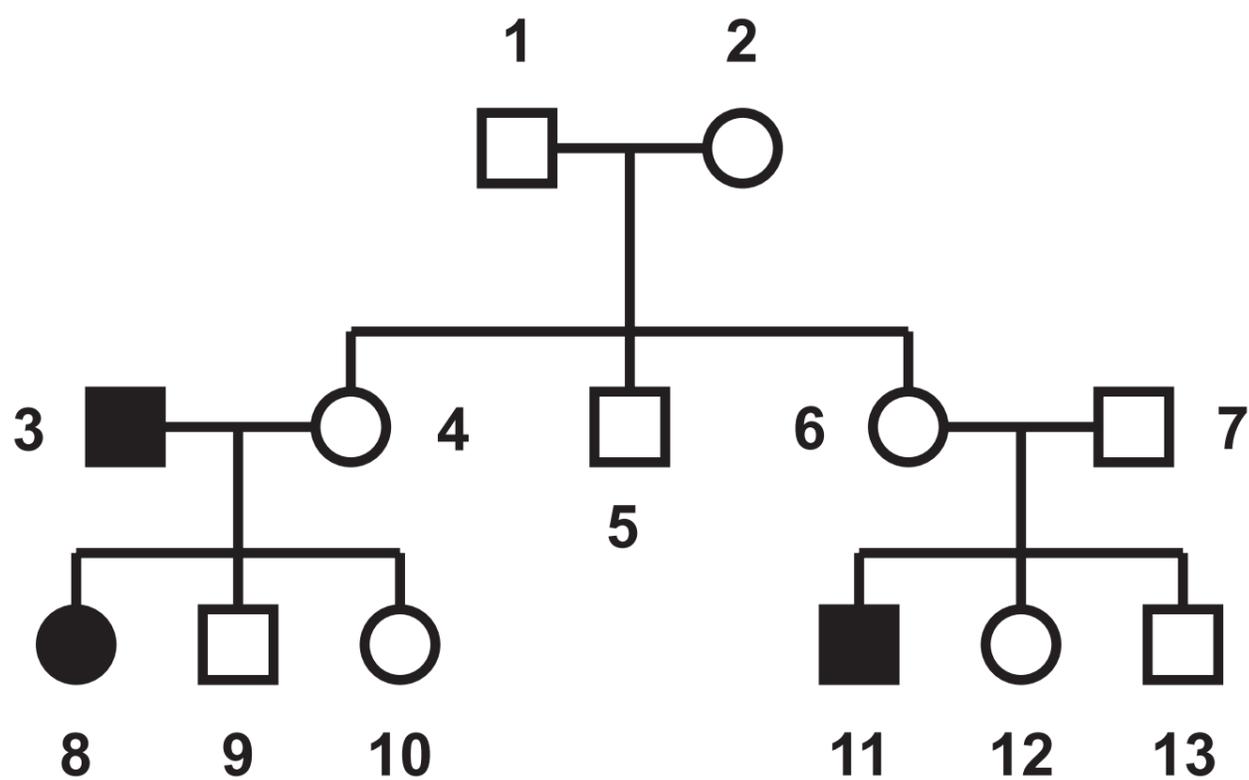
## Key

□ male without colour blindness

■ male with colour blindness

○ female without colour blindness

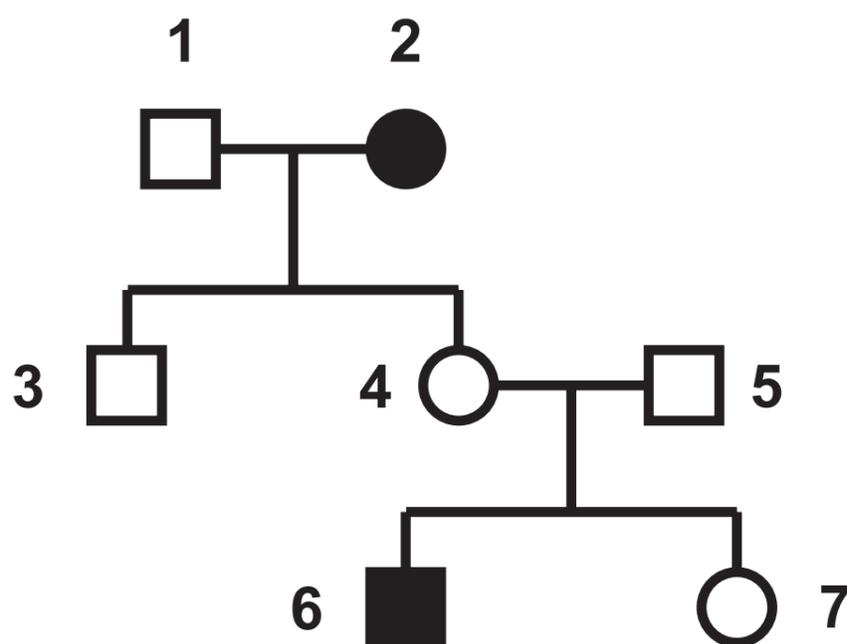
● female with colour blindness



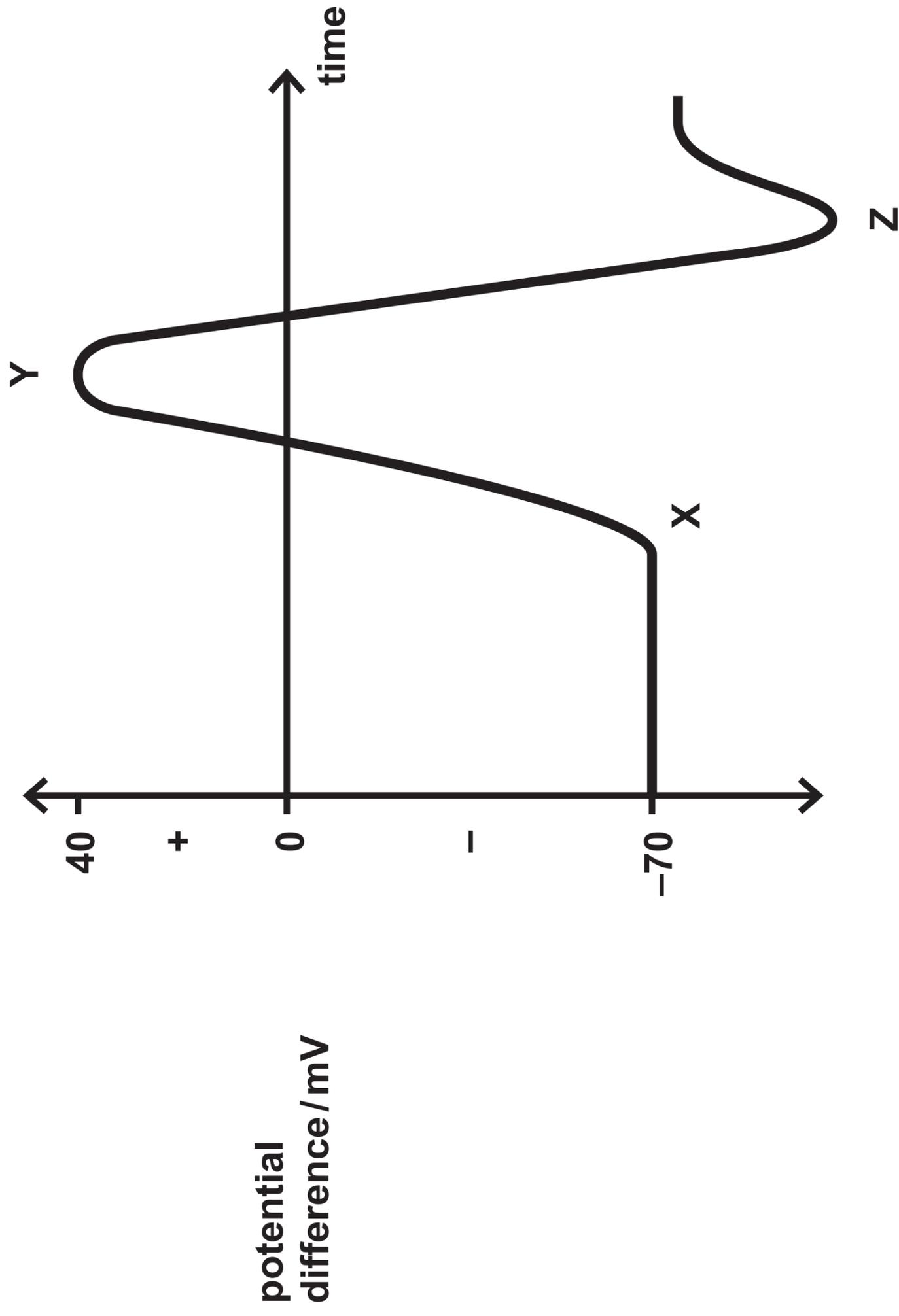
## Question 5(c)(i)

## Key

- male without achromatopsia
- male with achromatopsia
- female without achromatopsia
- female with achromatopsia



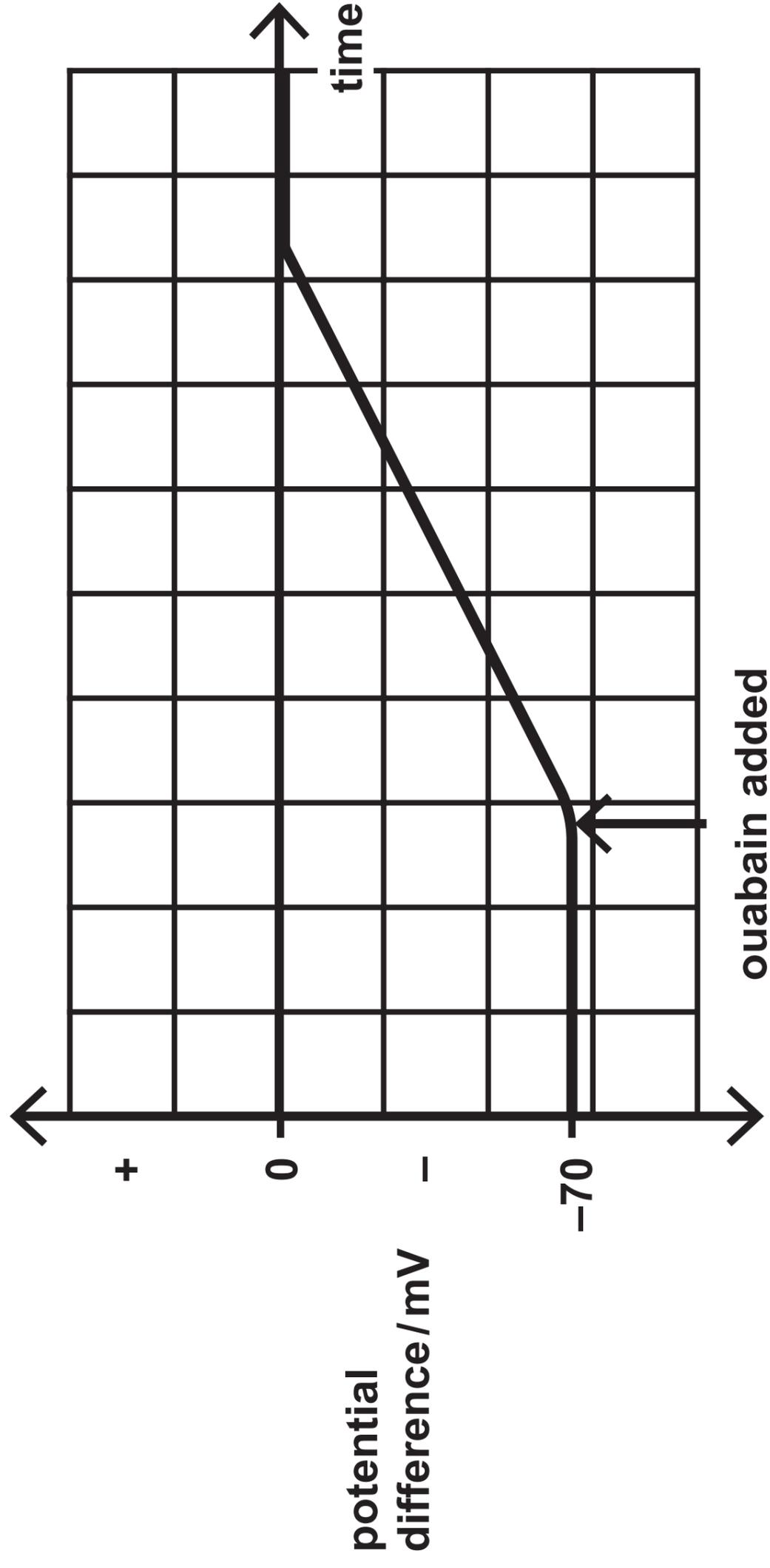
Question 6(a)



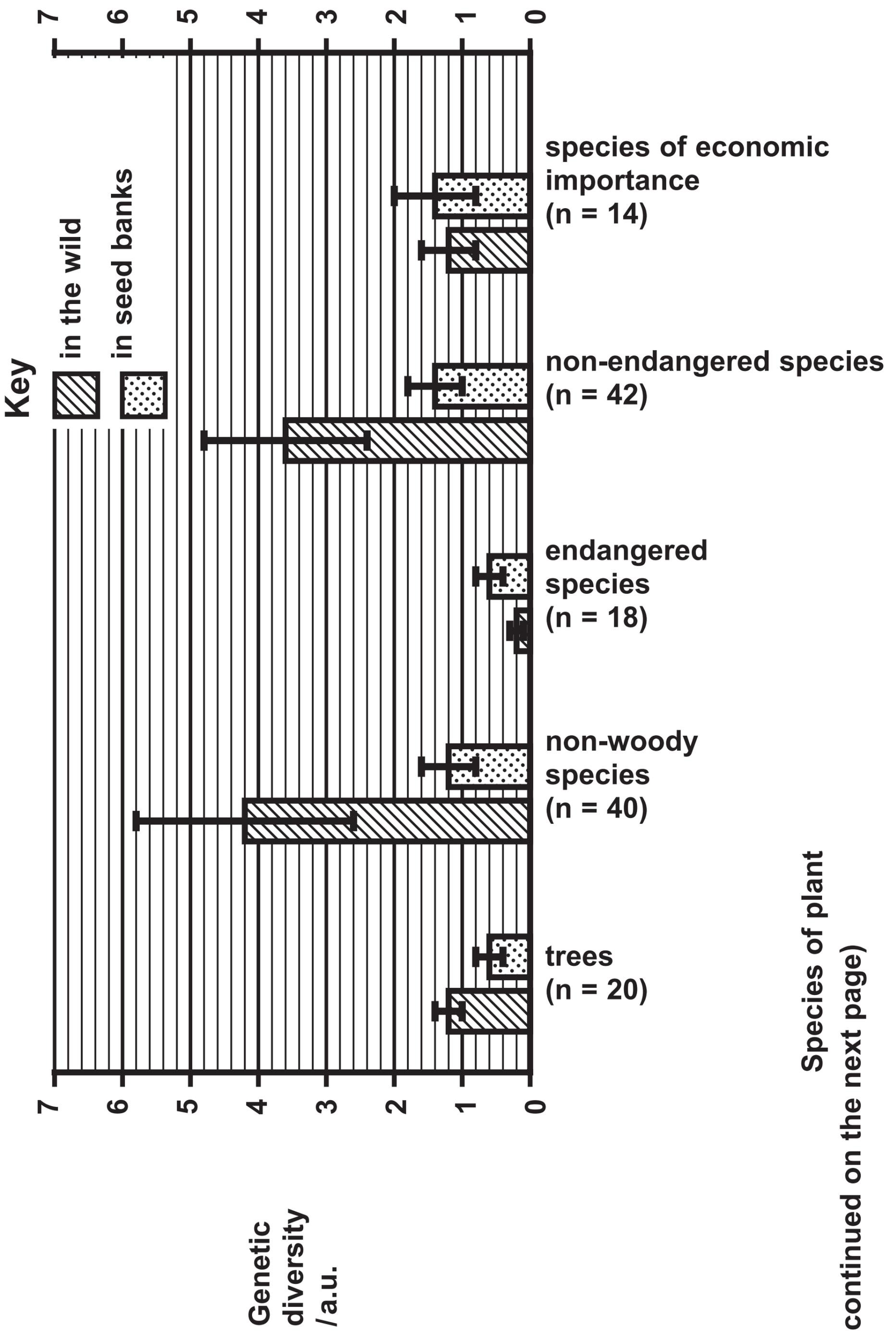
Question 6(b)



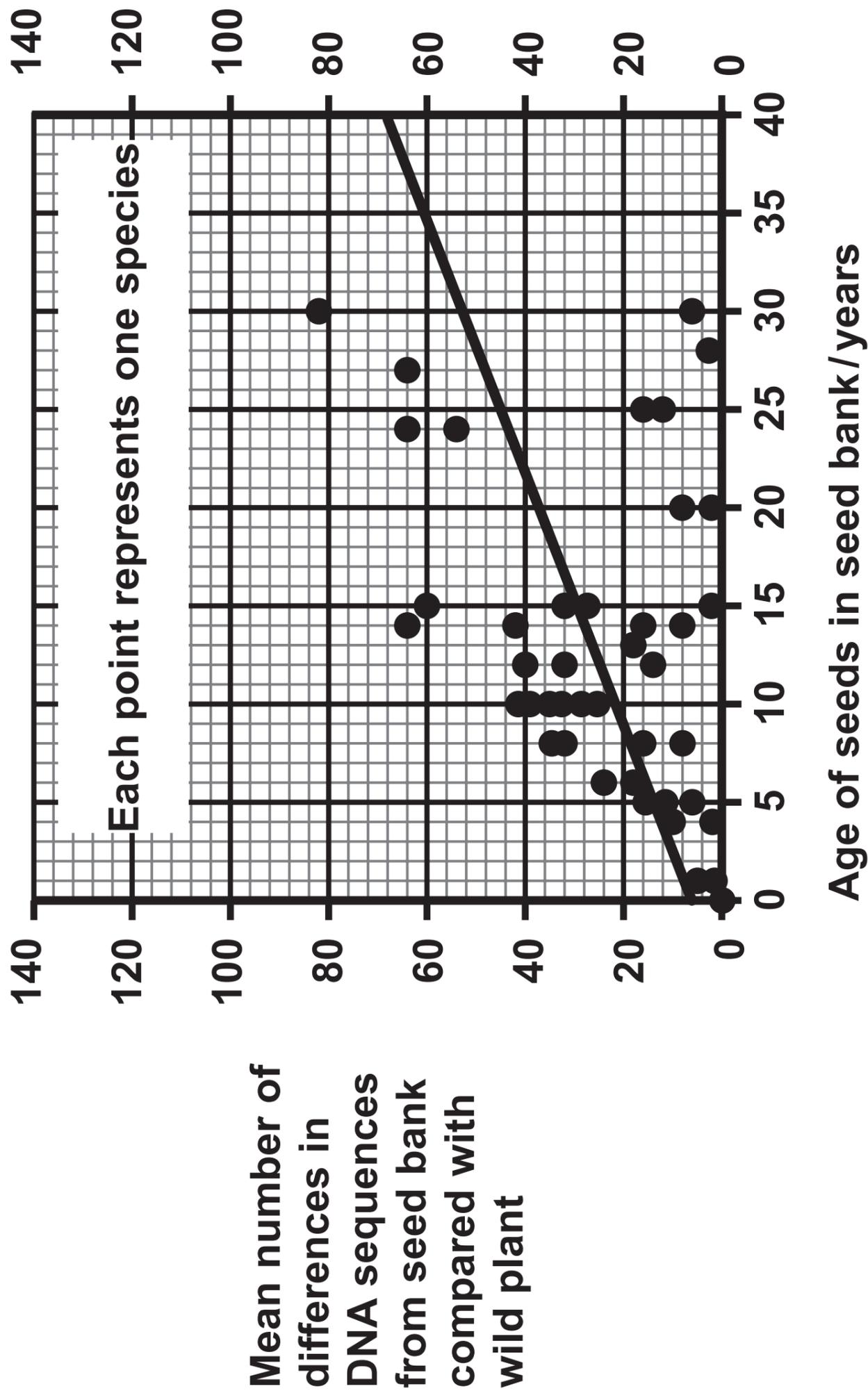
Question 6(b)(ii)



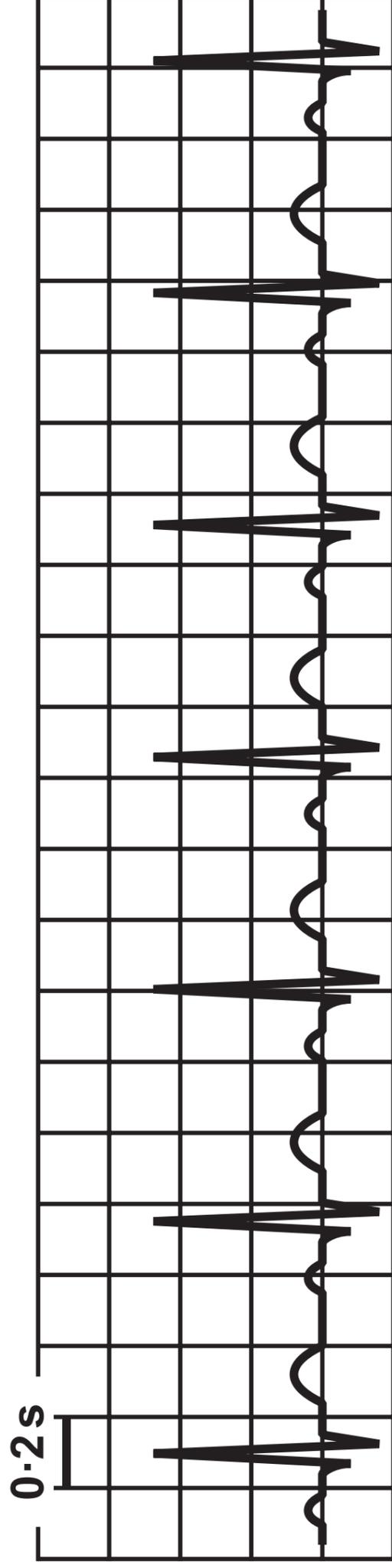
Question 7(b)



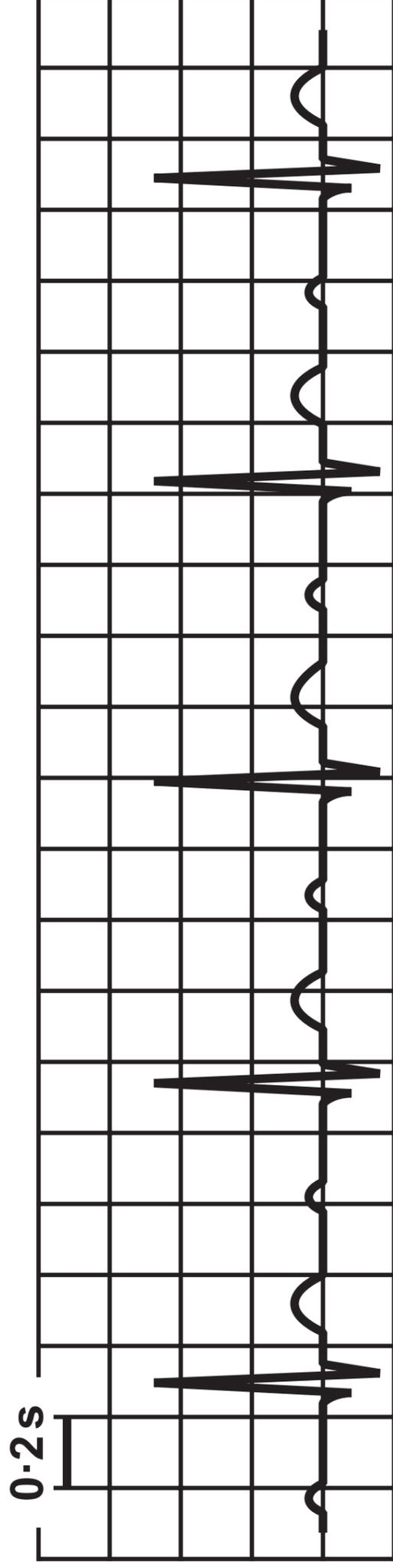
Question 7(b) continued.



Question 8(b)



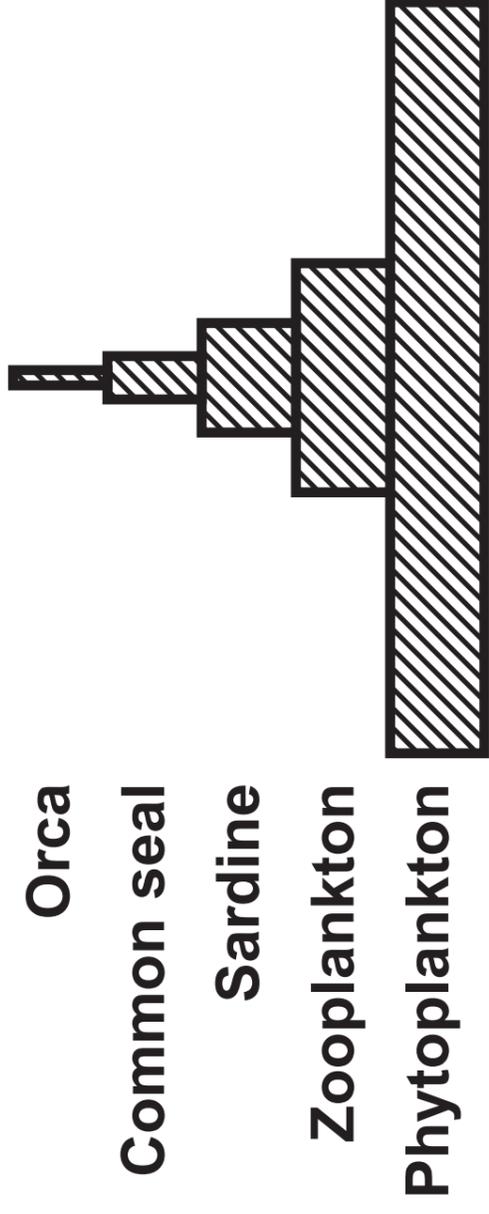
Person with regular heart rhythm



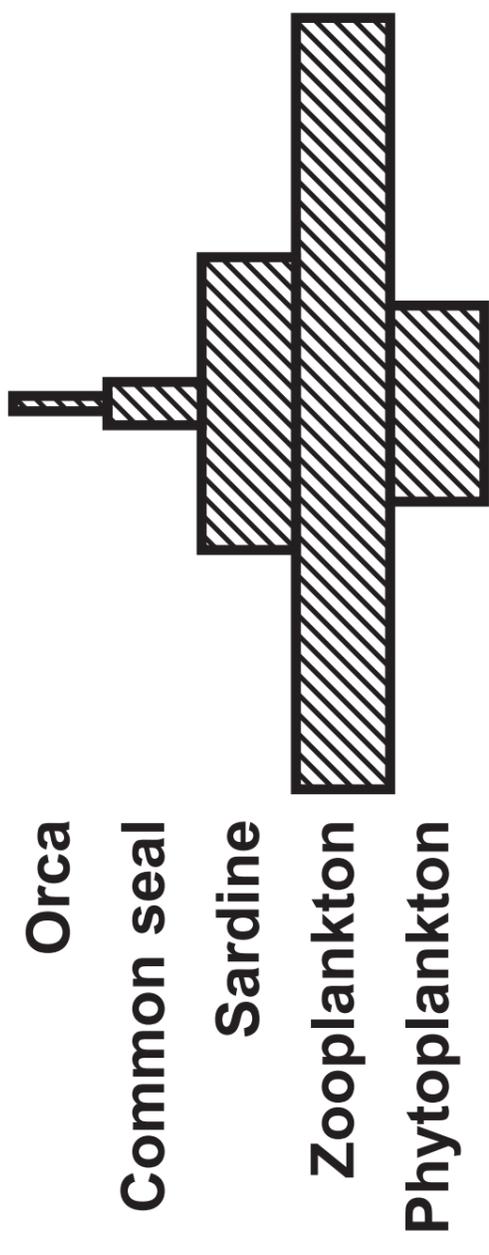
Person with abnormal heart rhythm

Question 9(a)

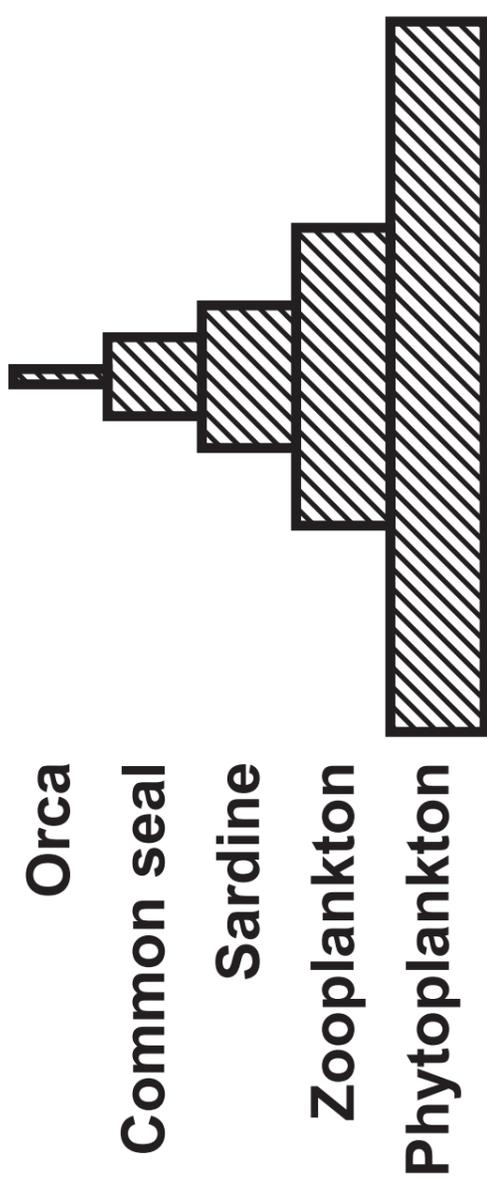
Pyramid of biomass  
for November



Pyramid of biomass  
for December



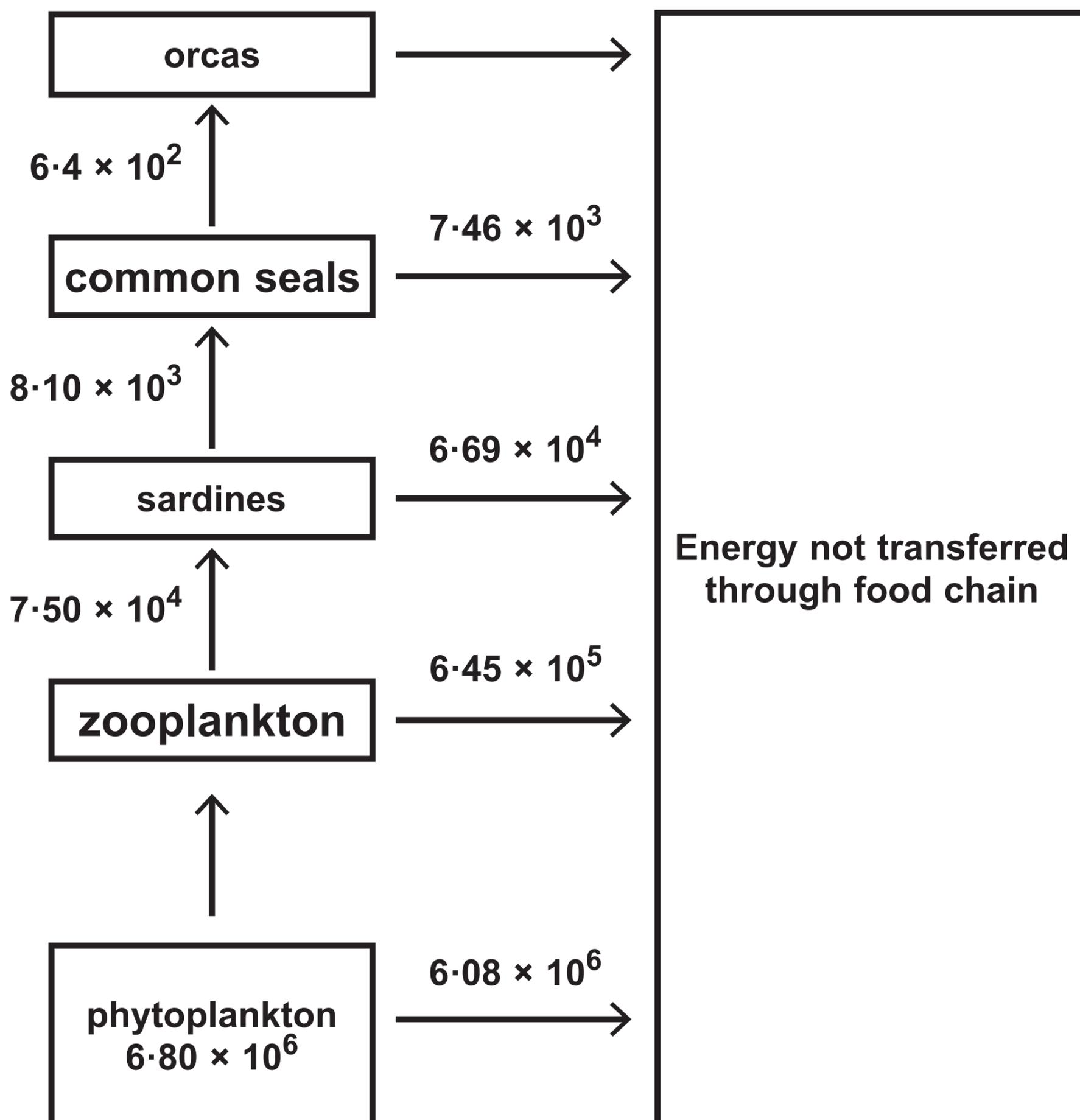
Pyramid of energy for one  
whole year



The units for biomass are  $\text{kg m}^{-3}$

The units for energy are  $\text{kJ m}^{-3} \text{yr}^{-1}$

## Question 9(b)



**Question 9(c)**

<b>Light intensity / arbitrary units</b>	<b>Mean increase in dry biomass of phytoplankton / g</b>		
	<b>10 °C</b>	<b>20 °C</b>	<b>30 °C</b>
	4	6	2
5			
10	8	10	4
15	10	20	15
20	12	24	28
25	12	28	35

**Question 3:**

**(Source: © M. I. WALKER / SCIENCE PHOTO LIBRARY)**

**Question 4(a):**

**(Source ©BOB GIBBONS / SCIENCE PHOTO LIBRARY)**

**Question 6(b):**

**(Source: © [https://commons.wikimedia.org/wiki/File:Lophiomys\\_imhausi.jpg](https://commons.wikimedia.org/wiki/File:Lophiomys_imhausi.jpg))**