

Biology A (Salters Nuffield)
Advanced
PAPER 3: General and Practical Applications in Biology

Wednesday 19 June 2024 – Morning

Time: 2 hours

Diagram Booklet

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

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

Surname					
Other names					
Centre Number					
Candidate Number					

INSTRUCTIONS

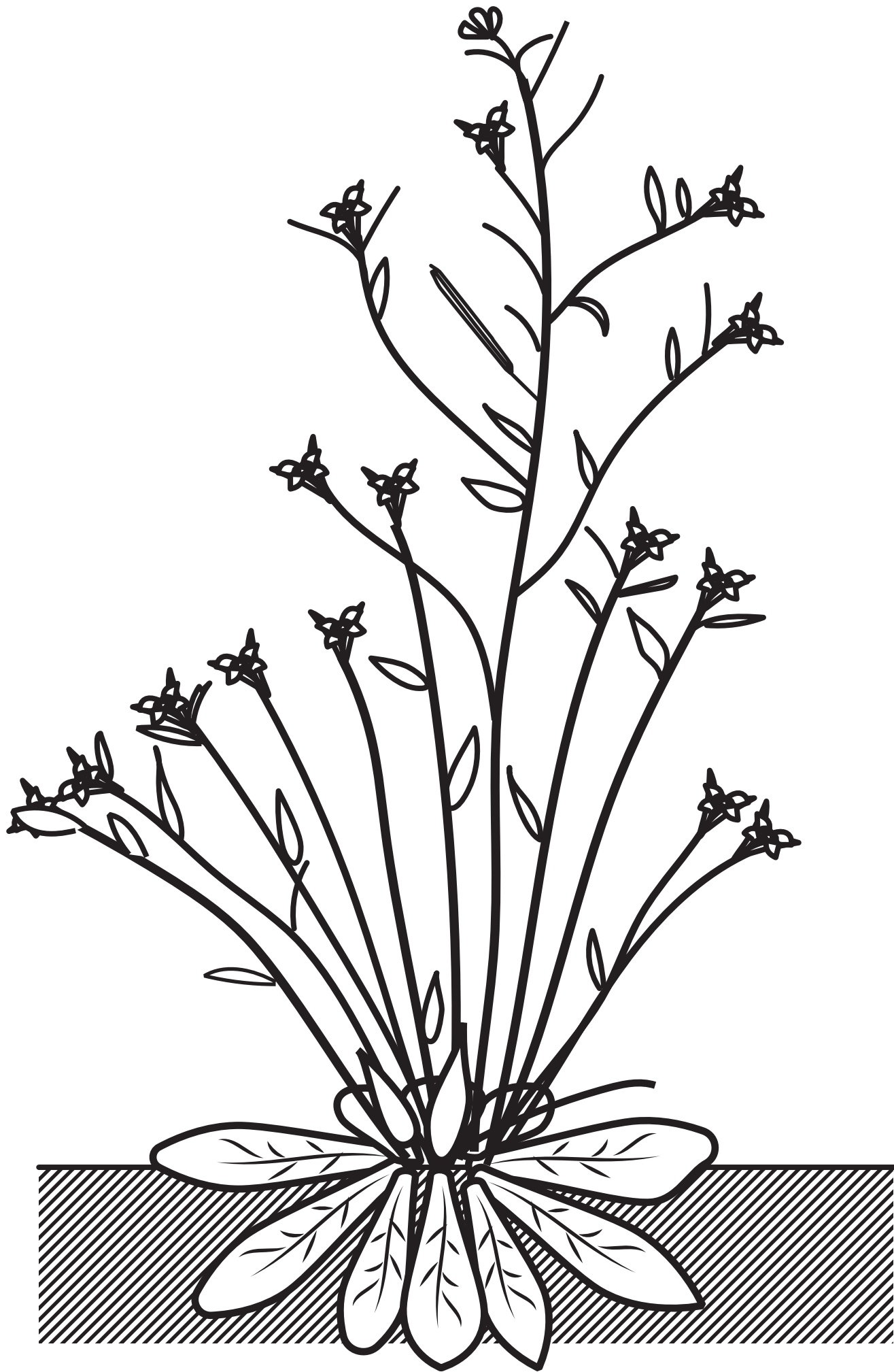
There may be spare copies of some diagrams in case you need them.

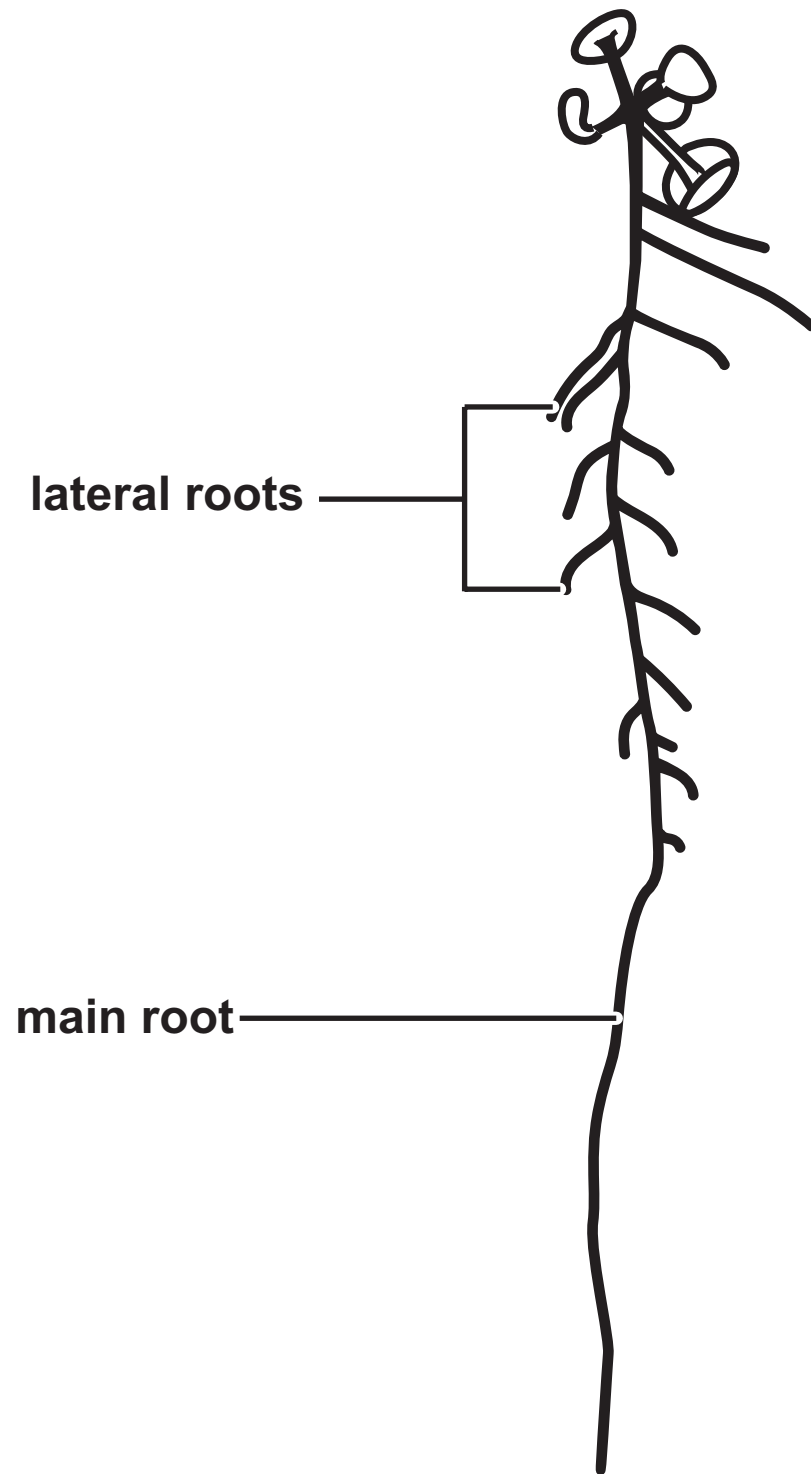
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Question 1



Question 1(c) – diagram

Question 1(c) – graph

KEY

Thale cress homozygous for:

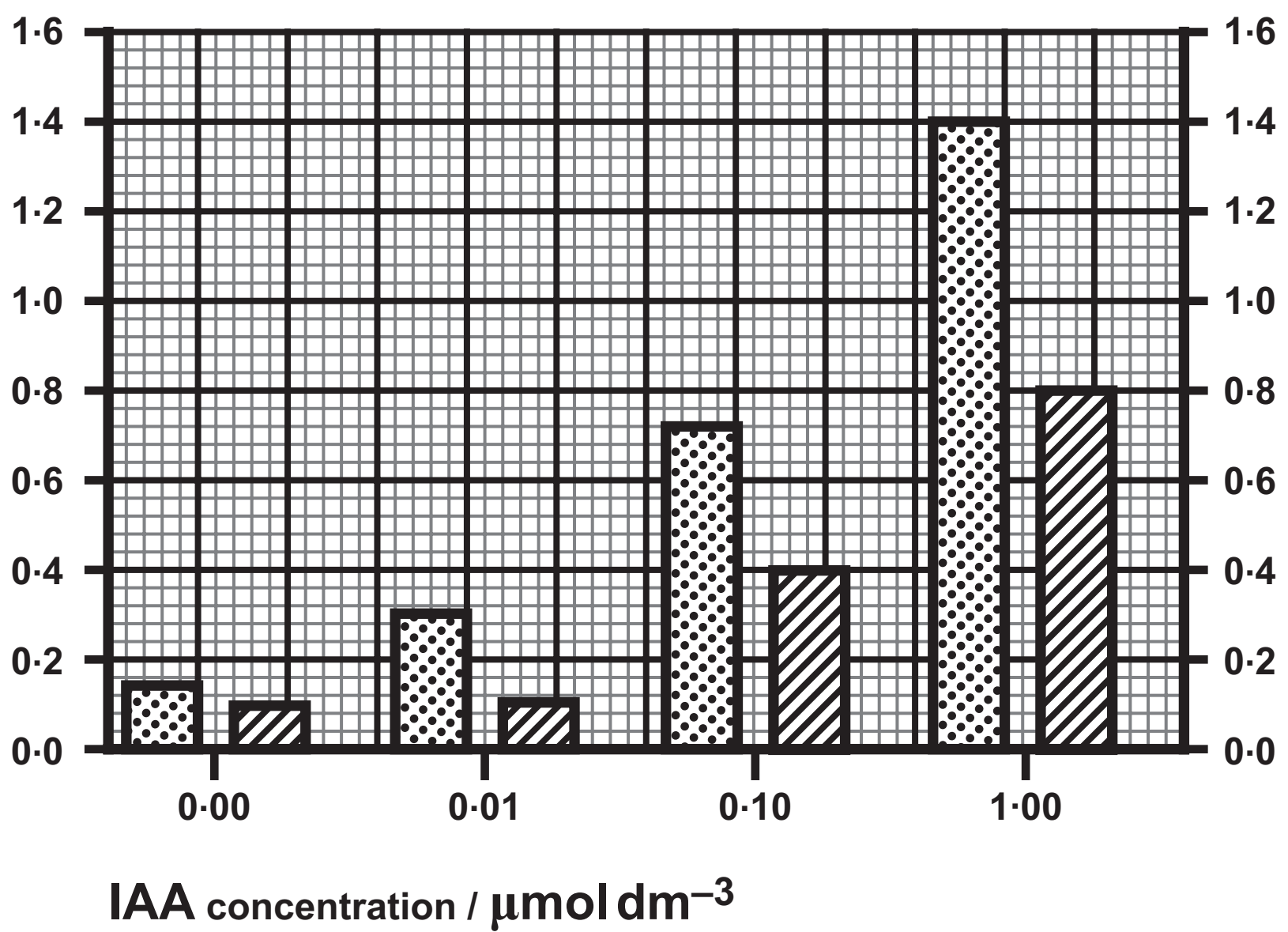


normal **tir1** gene

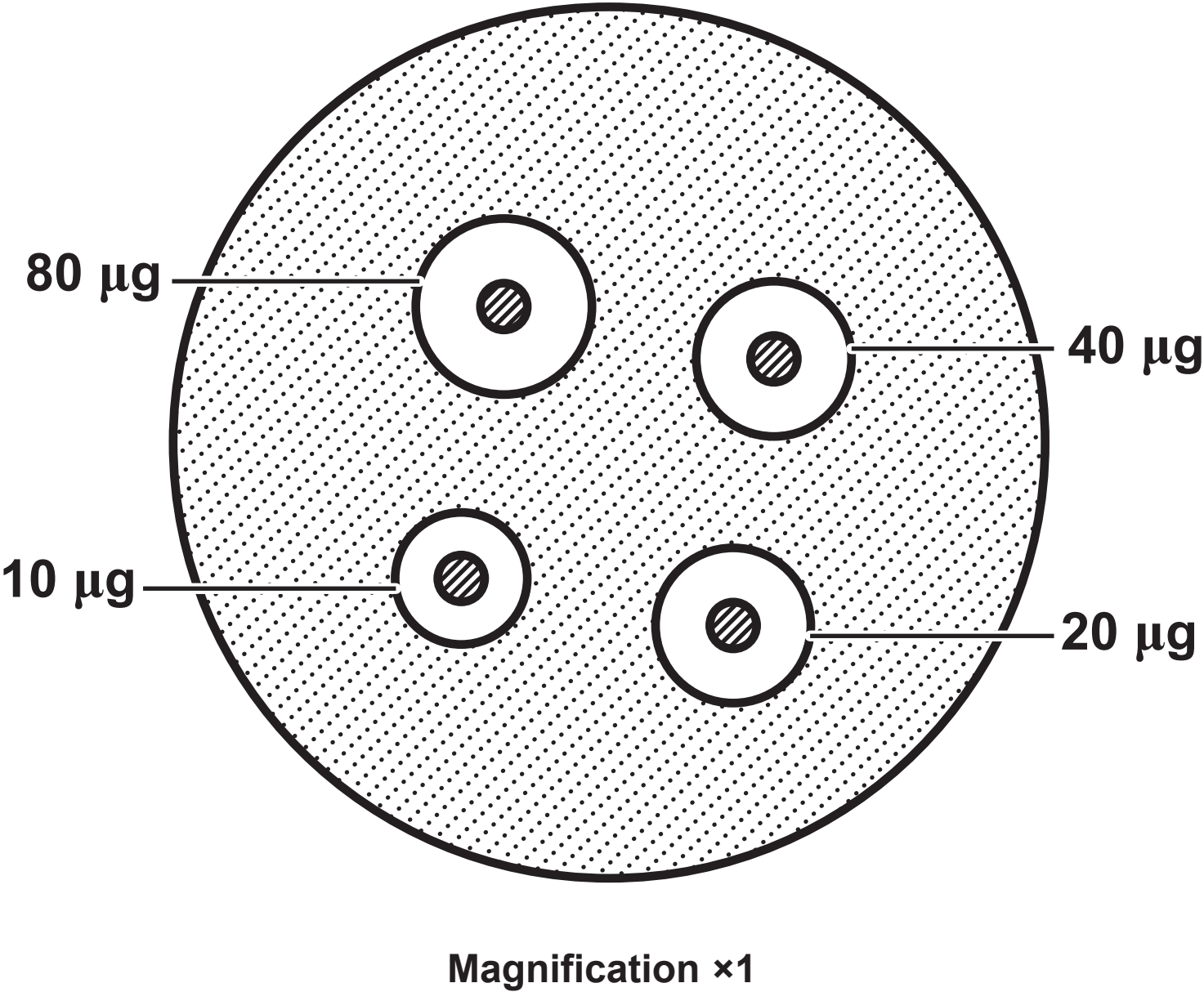


mutant **tir1** gene

Mean number of lateral
roots per mm



Question 2

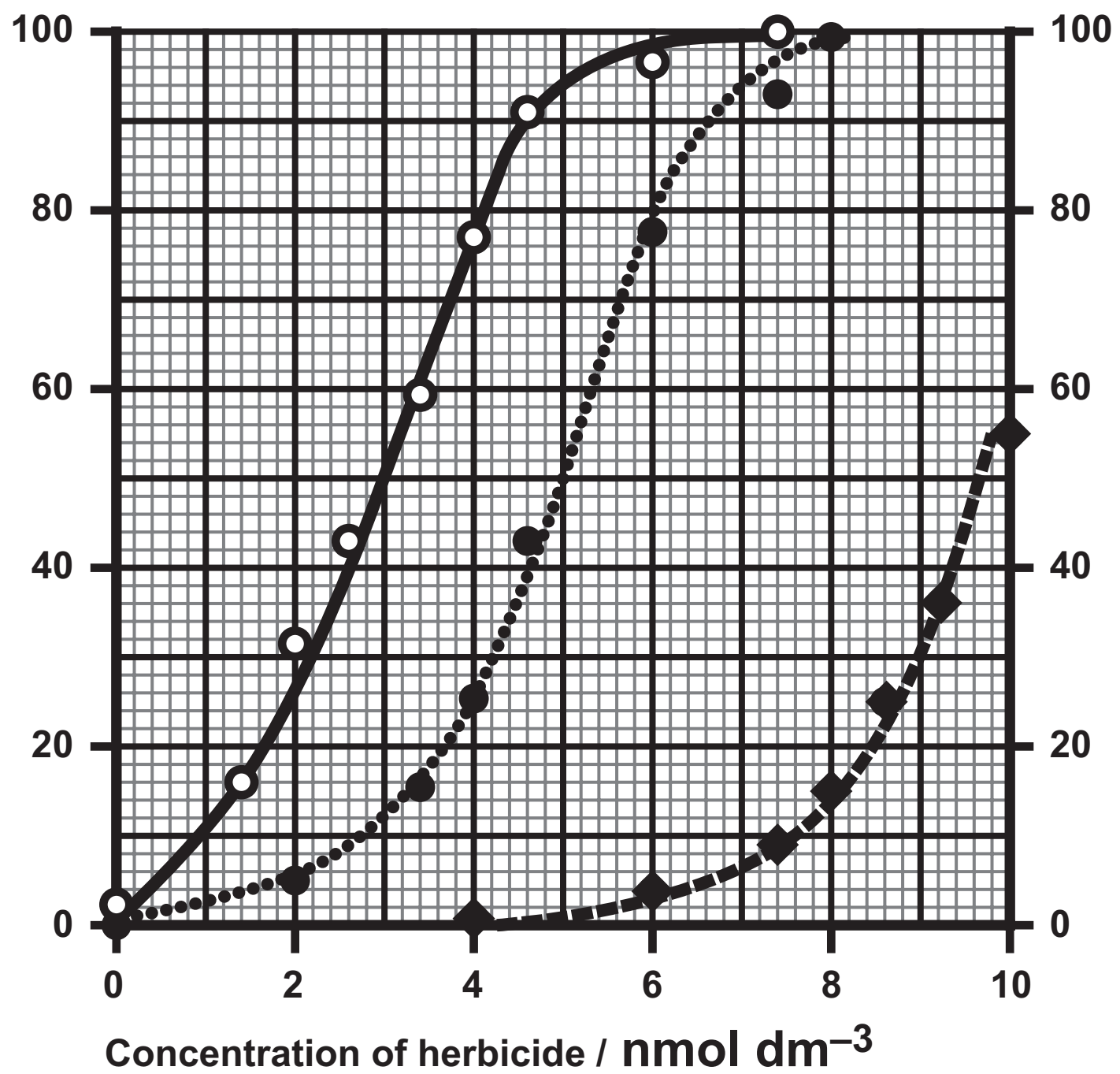


Question 3(a)

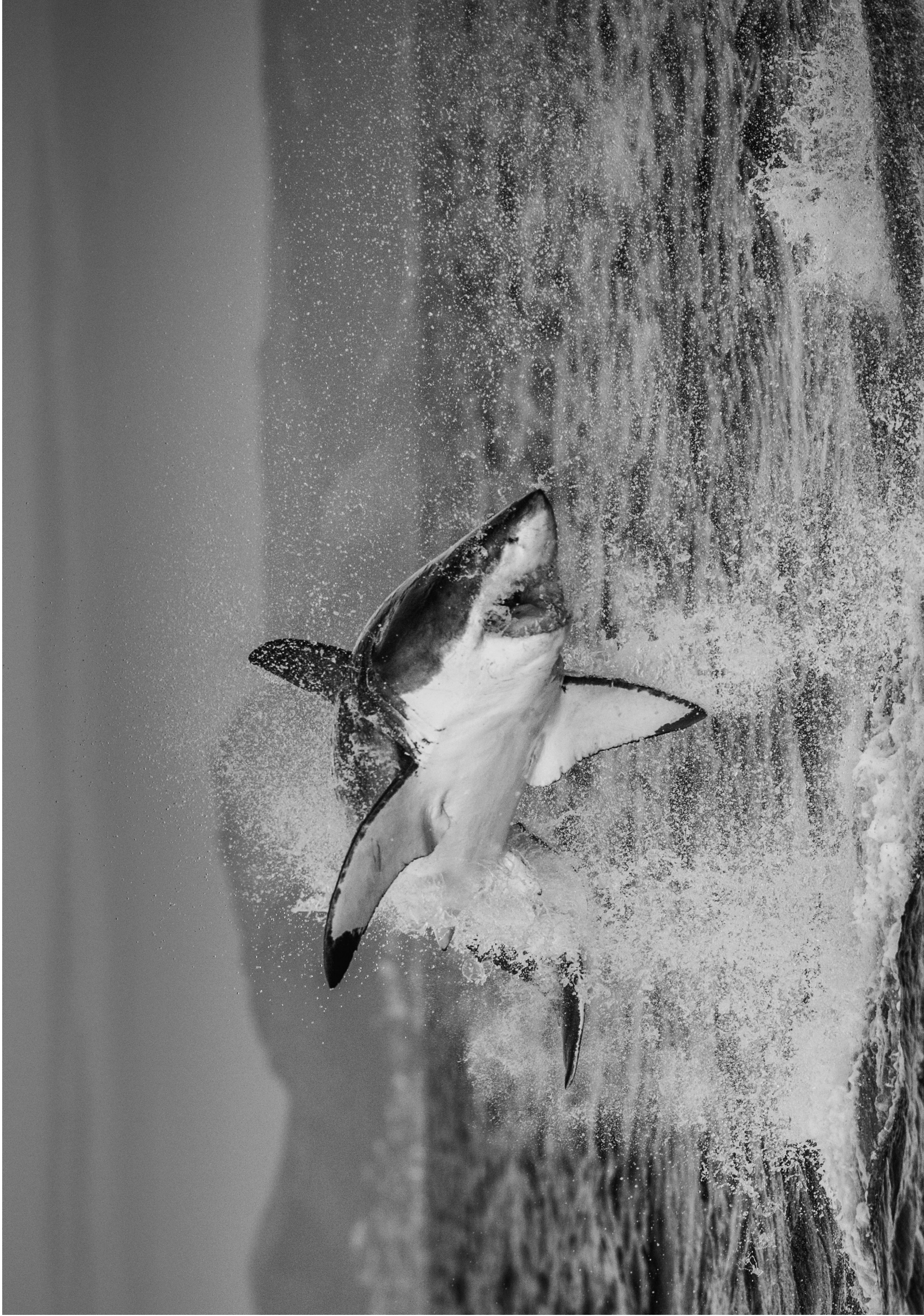
KEY

- Herbicide A
 ...●... Herbicide B
 -◆- Herbicide C

Percentage
inhibition of the
Hill reaction (%)



Great white shark



(continued on the next page)

Turn over

Humpback whale



(continued on the next page)

Turn over

Question 4 continued.

Tertiary consumer
e.g. great white shark



Secondary consumer
e.g. fish

Secondary consumer
e.g. humpback whale



Primary consumer
e.g. zooplankton

Primary consumer
e.g. krill



Primary producer
e.g. phytoplankton

Primary producer
e.g. phytoplankton

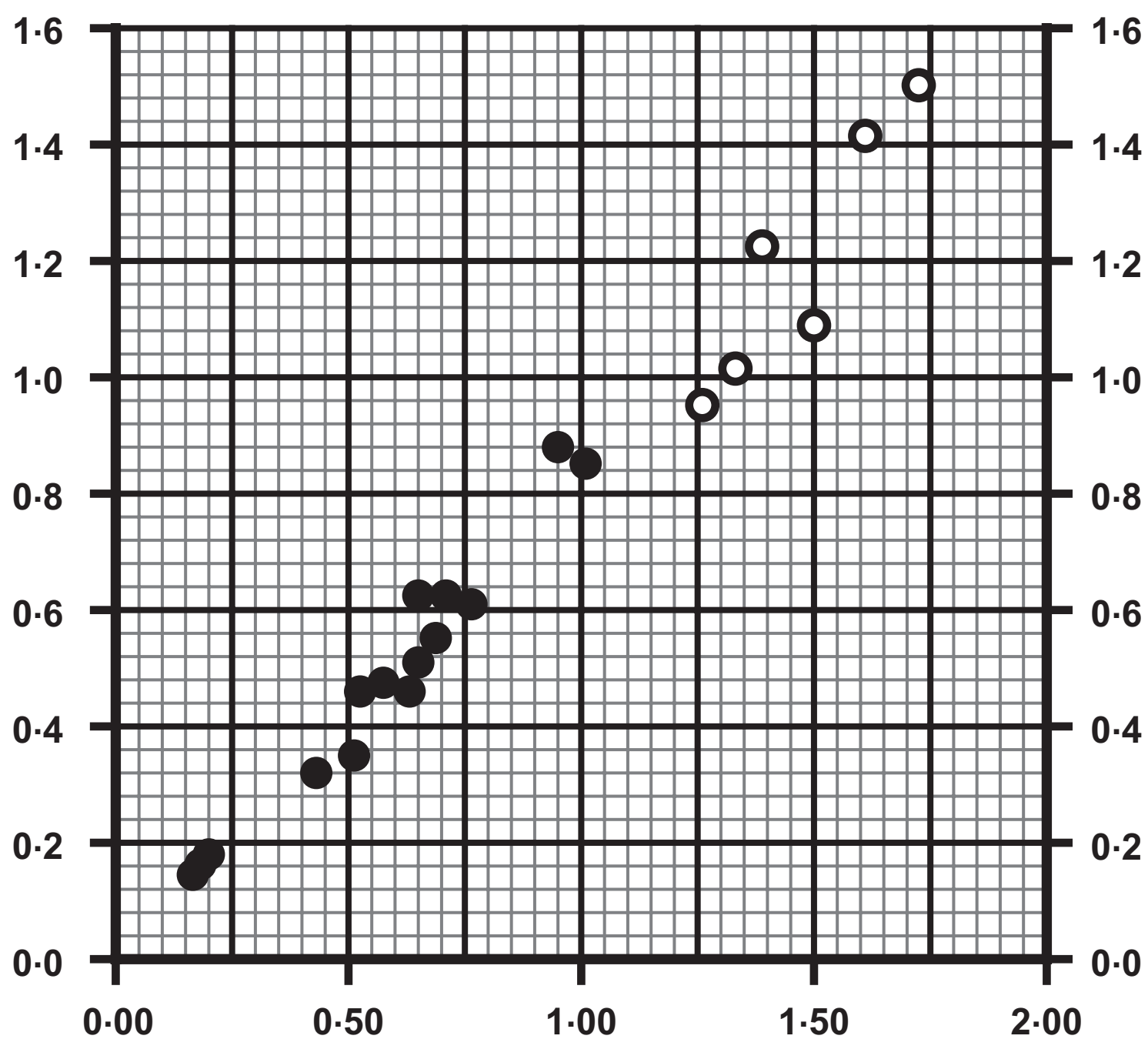
Question 4(c)

KEY

● 17°C

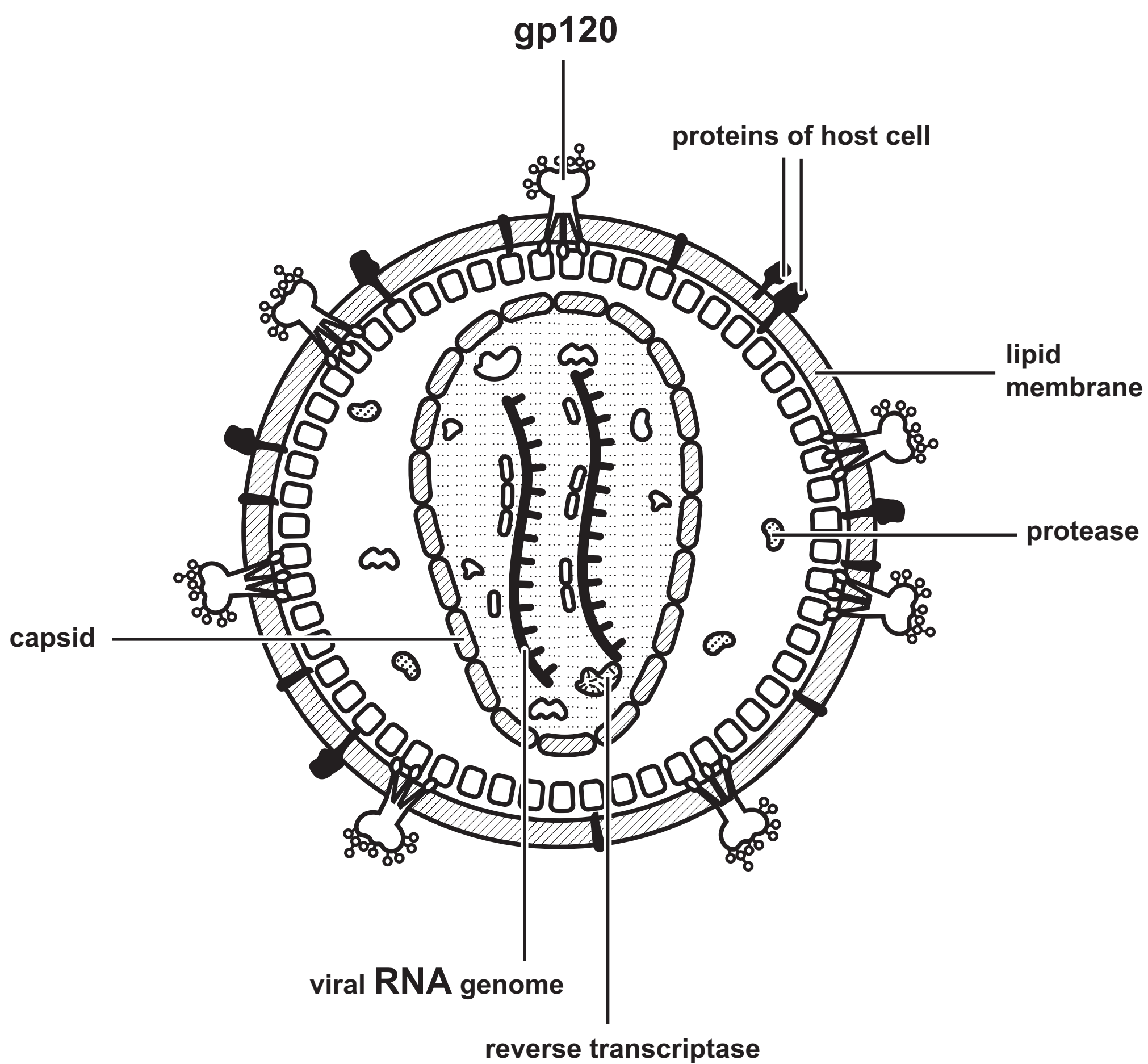
○ 14°C

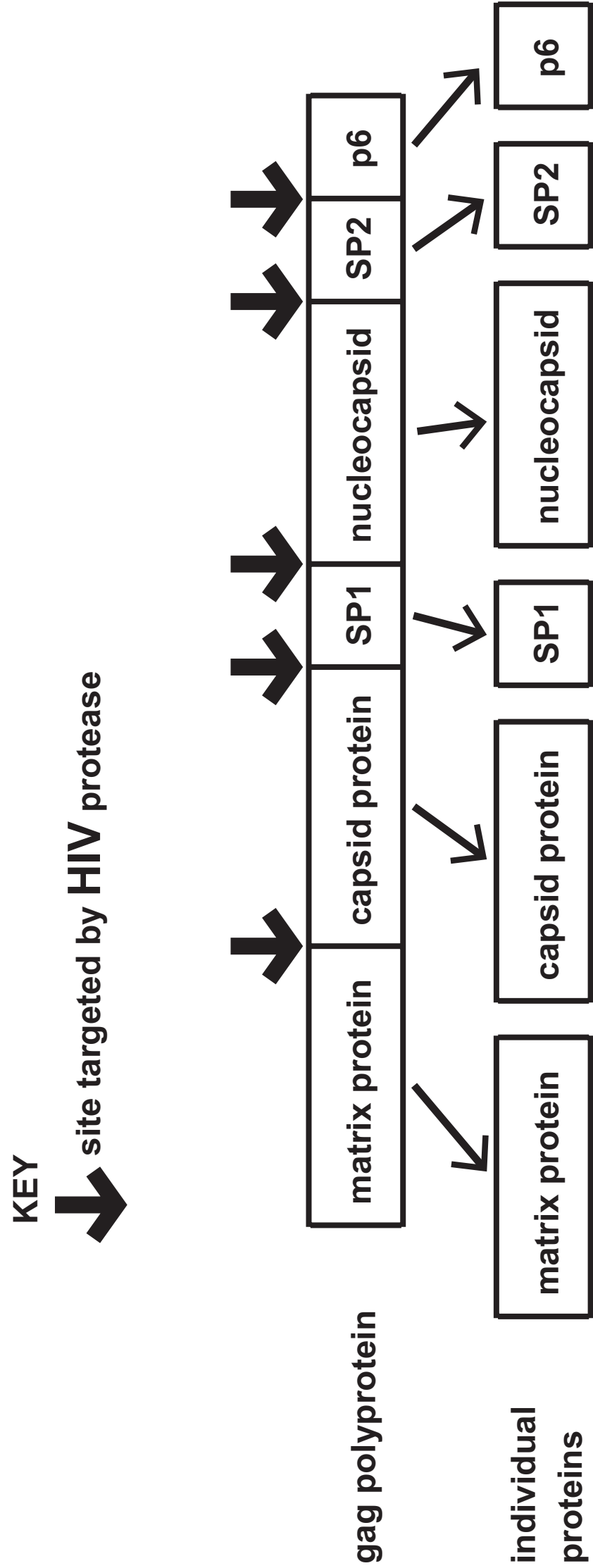
CO₂ produced per
individual / $\mu\text{m}^3 \text{ hour}^{-1}$



Uptake of O₂ per individual / $\mu\text{m}^3 \text{ hour}^{-1}$

Question 5(a)





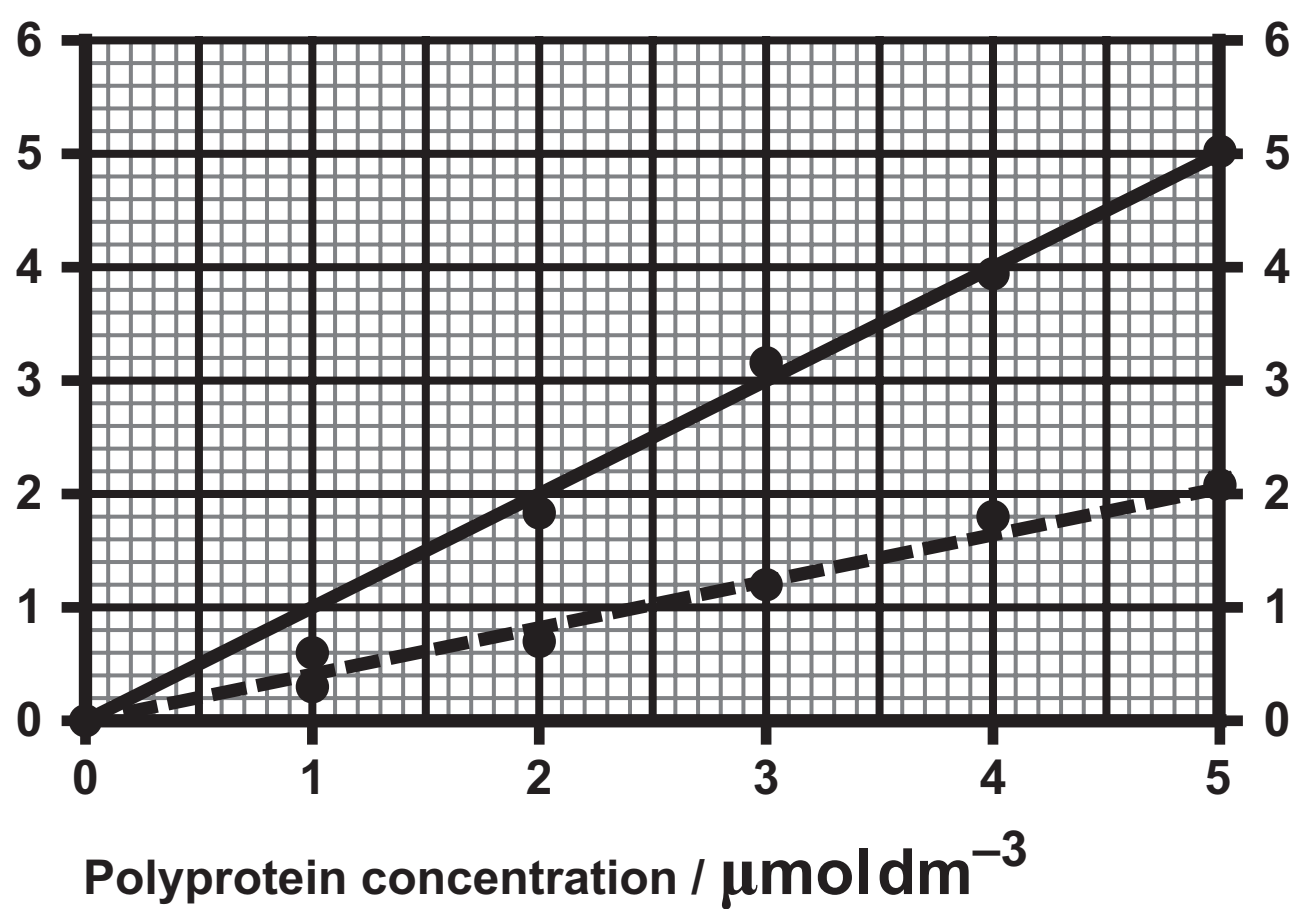
Question 5(c)

KEY

———— normal **HIV** protease

----- inhibitor-resistant **HIV** protease

Initial rate of reaction
/ $\mu\text{mol dm}^{-3}\text{s}^{-1}$

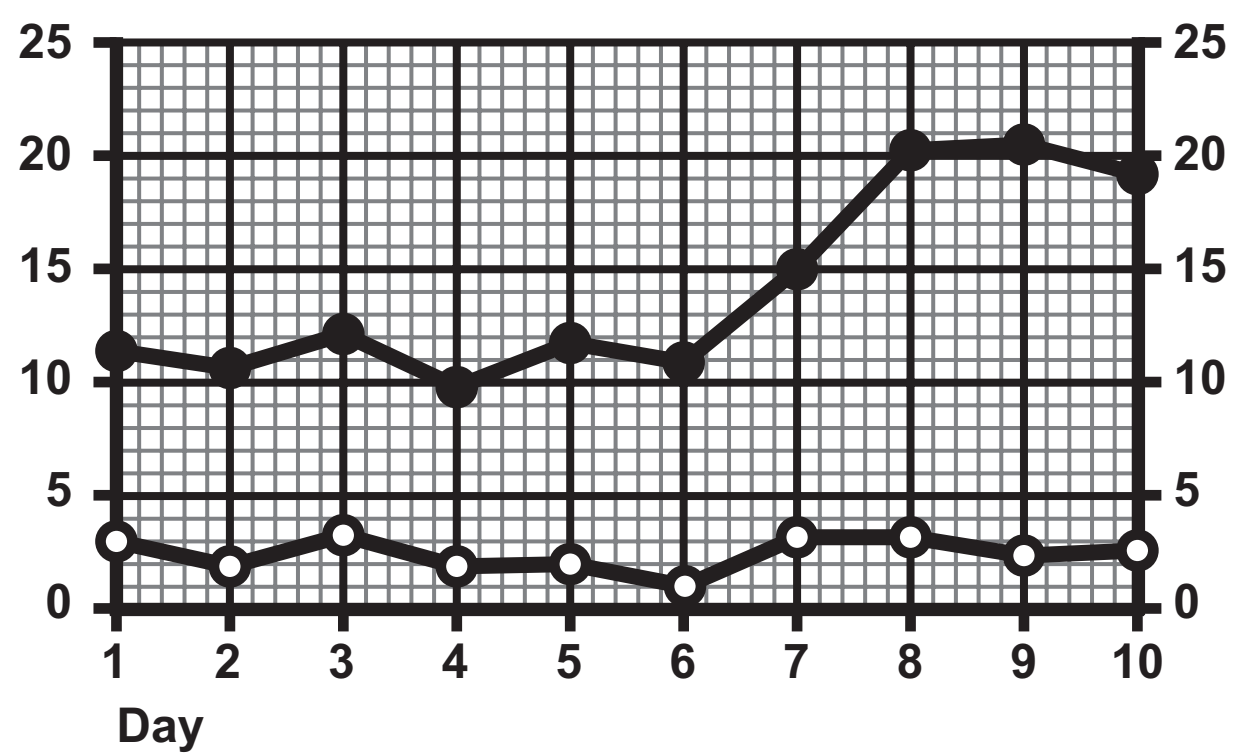


Question 6(a)(ii)

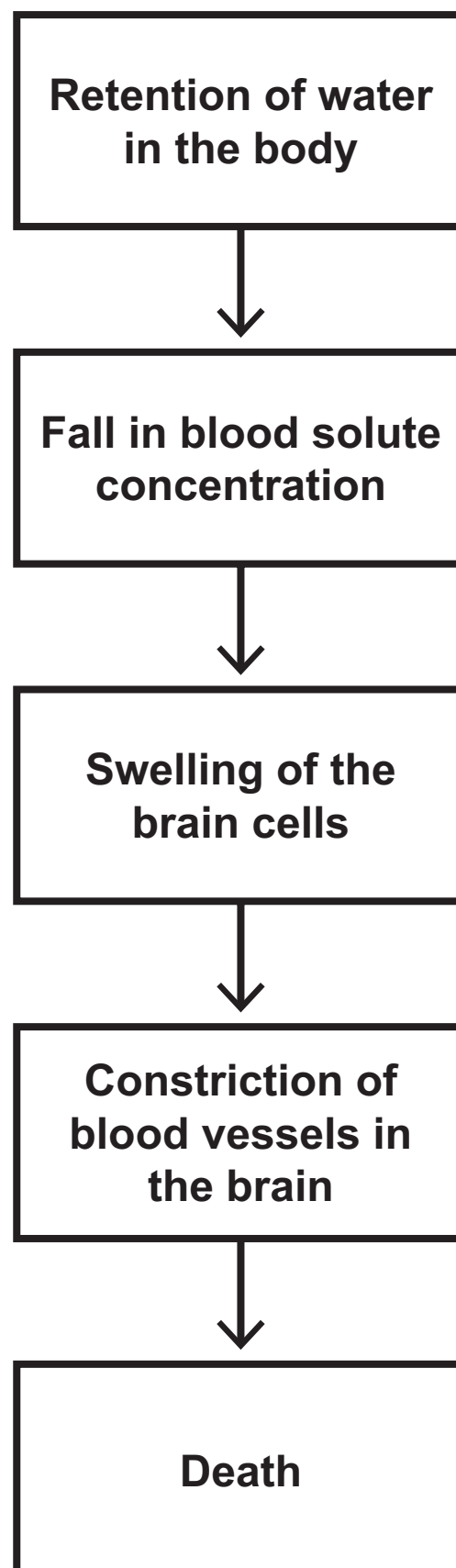
KEY:

—●— MDMA button

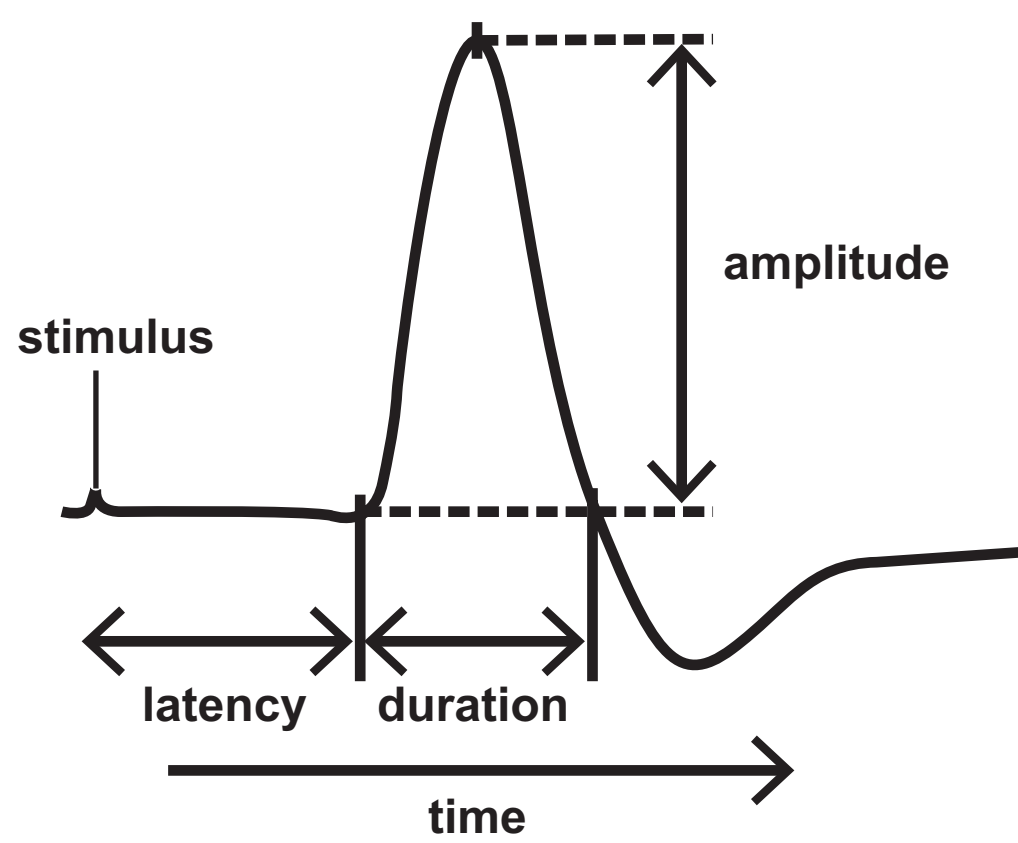
—○— Control button

Number of button
presses in 3 hours

Question 6(b)



Question 7 – diagram



Question 7 – graphs

KEY:

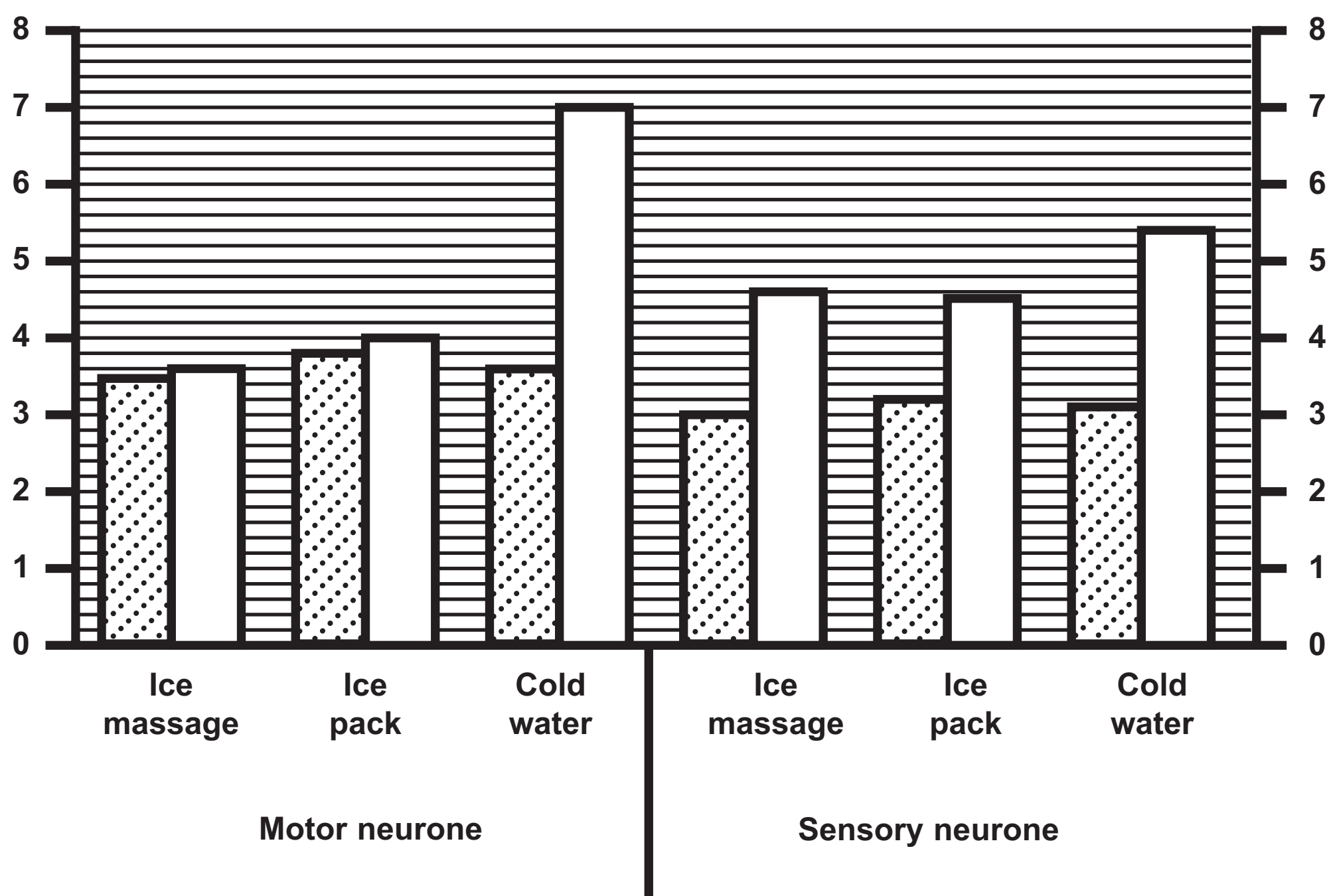


Pre-treatment



Post-treatment

Latency / ms



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Turn over

Question 7 – graphs continued.

KEY:

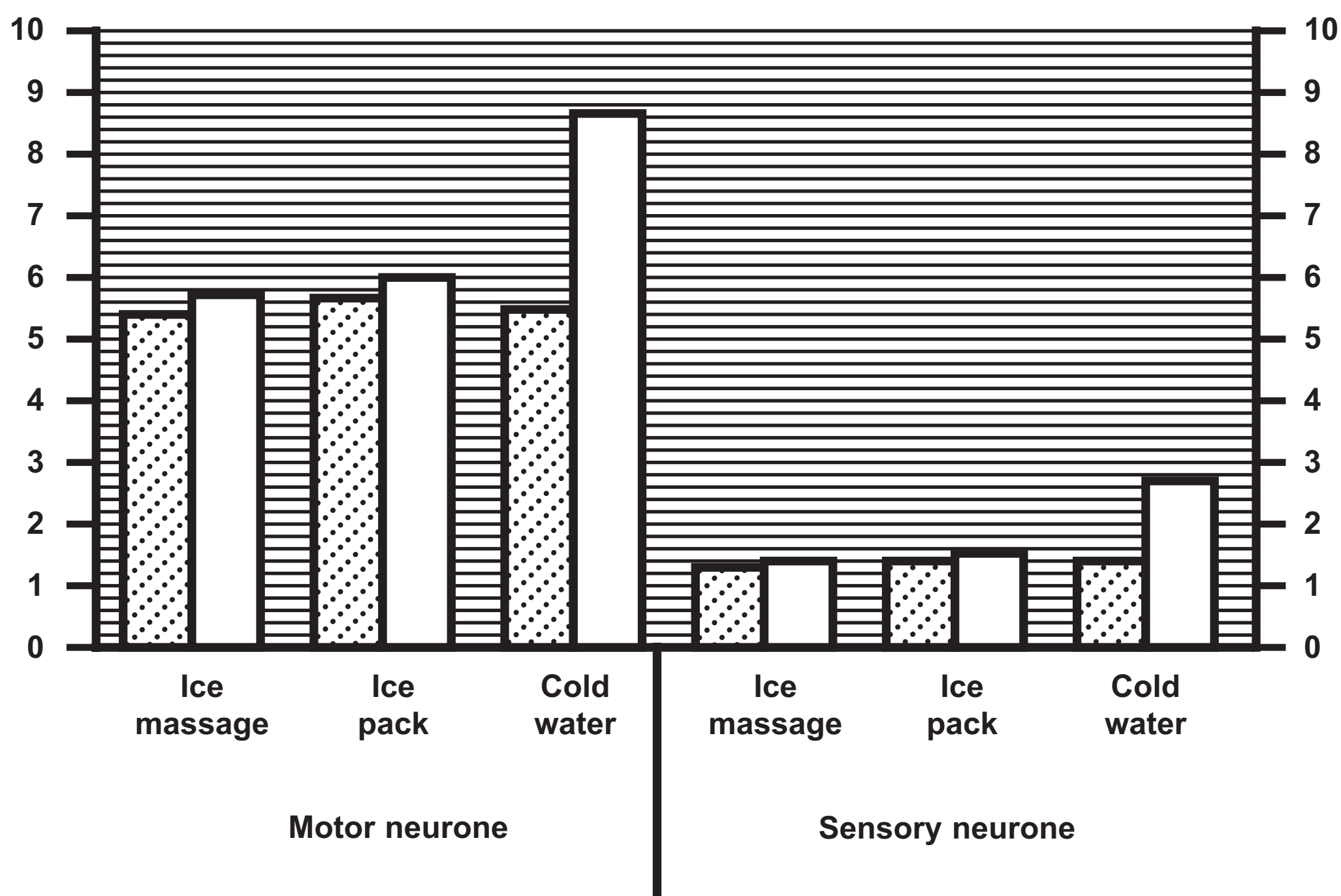


Pre-treatment



Post-treatment

Duration / ms



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Turn over

Question 7 – graphs continued.

KEY:

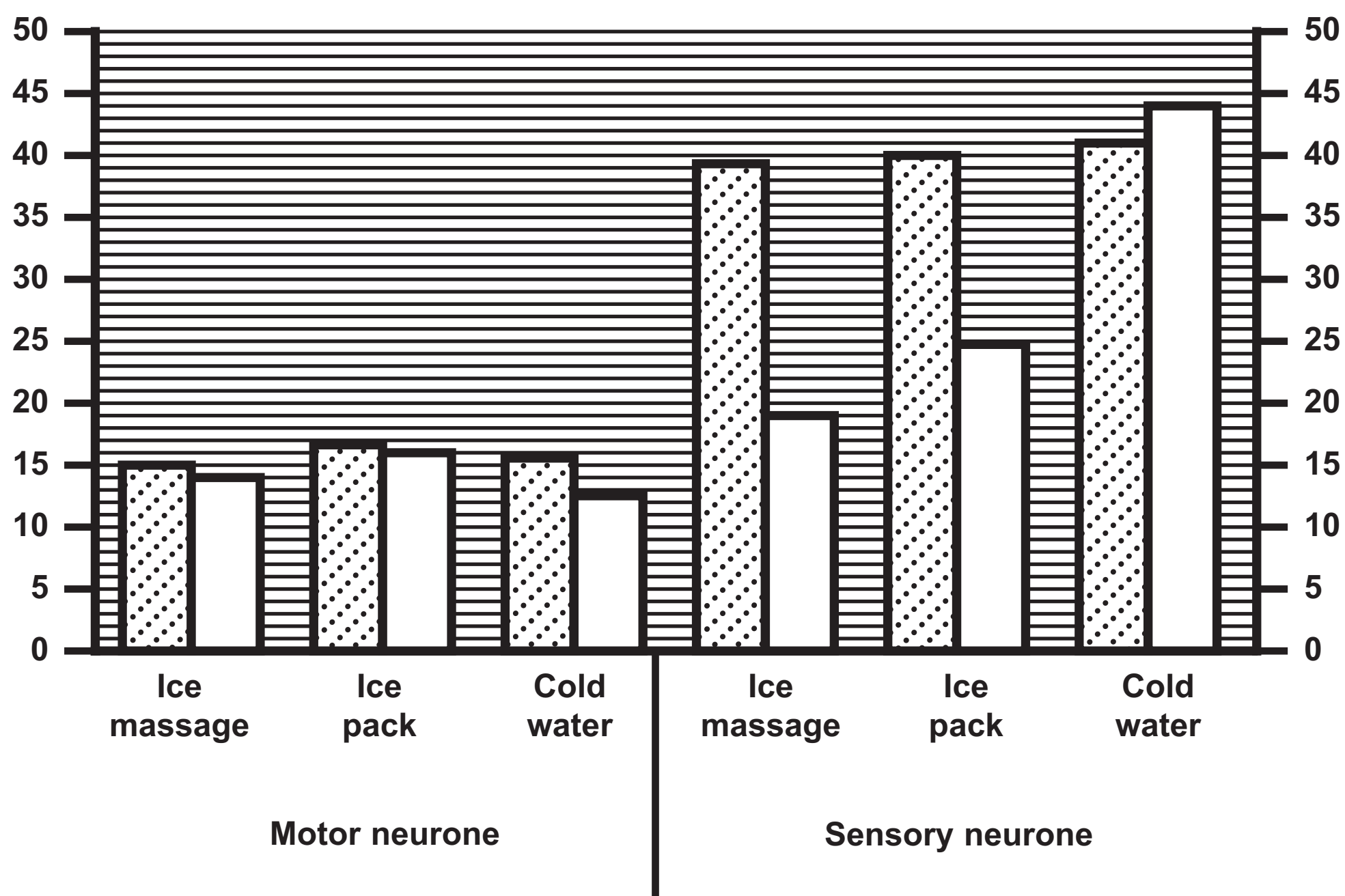


Pre-treatment



Post-treatment

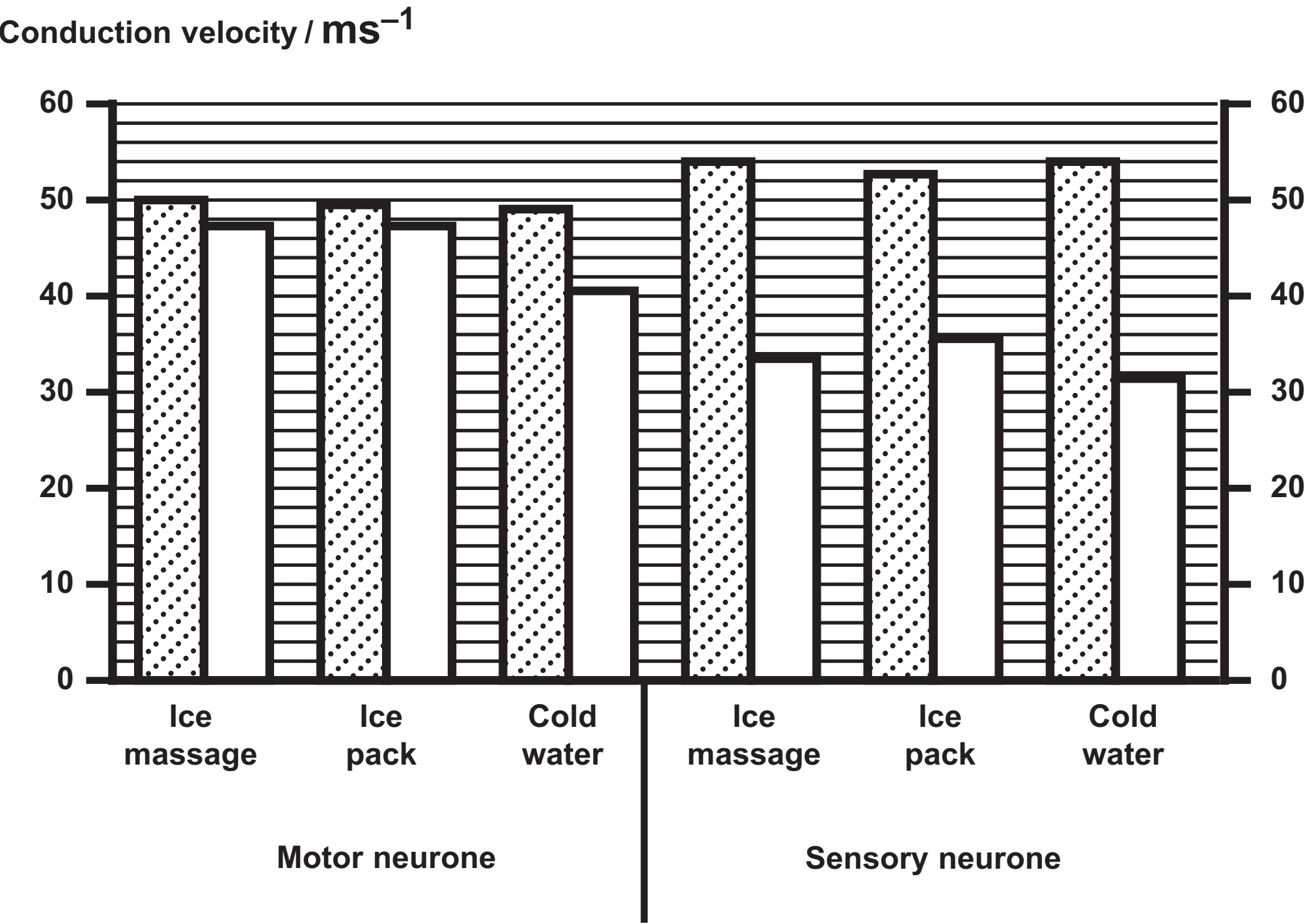
Amplitude / mV



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Turn over

Question 7 – graphs continued.



Question 1

(Source: Nigel Cattlin / Alamy Stock Photo)

Question 4

(Source: Sergey Uryadnikov/Shutterstock)

(Source: Mircea Costina / Alamy Stock Photo)