

Paper Reference(s) 9BN0/03
Pearson Edexcel Level 3 GCE

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

Diagram Booklet

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.

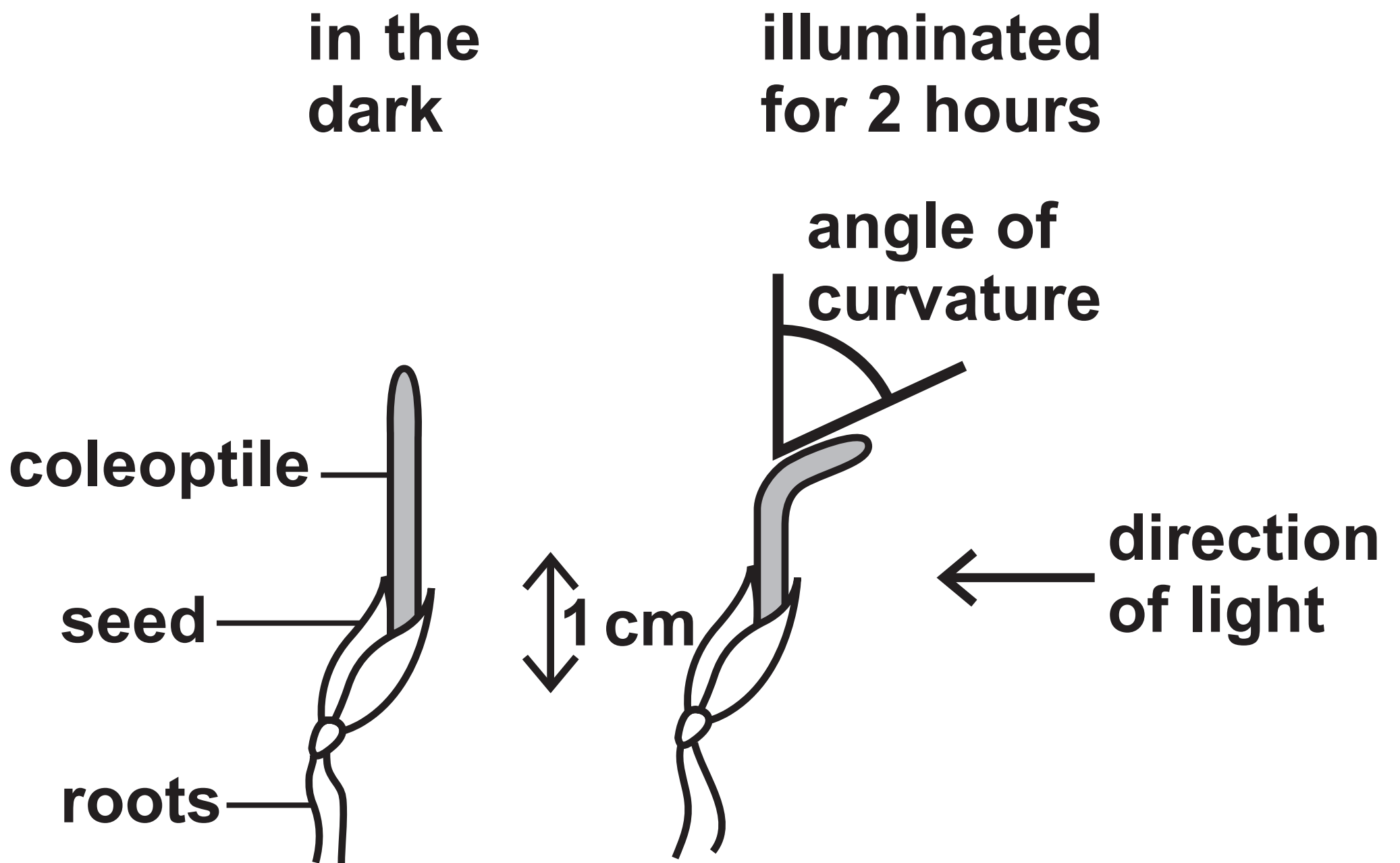
**THIS DIAGRAM BOOKLET MUST BE
RETURNED WITH THE QUESTION PAPER
AT THE END OF THE EXAMINATION.**

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Question 1(a)

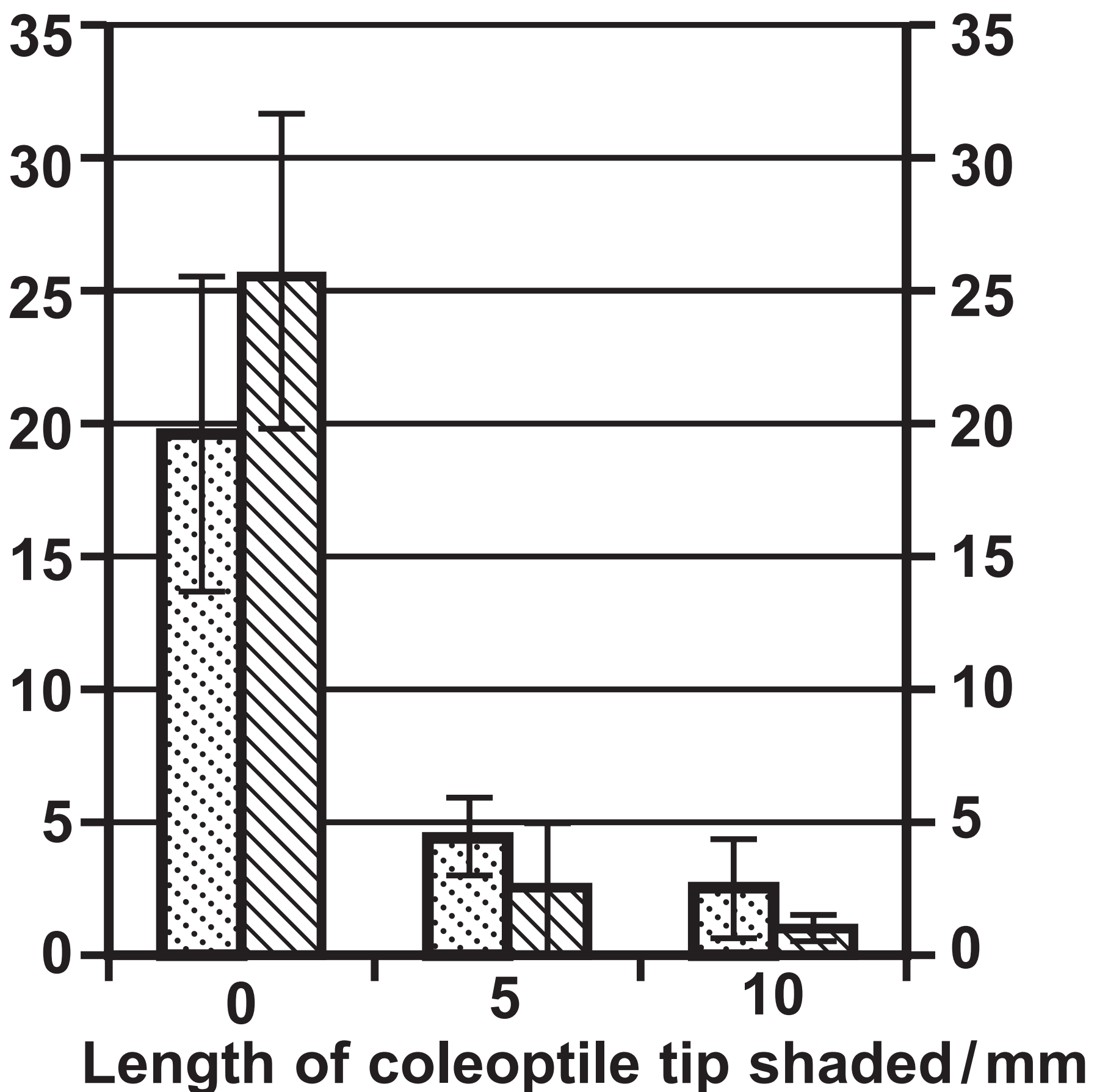


Question 1(a)

KEY

 2 hours 3 hours

Mean angle of curvature of
coleoptiles / degrees

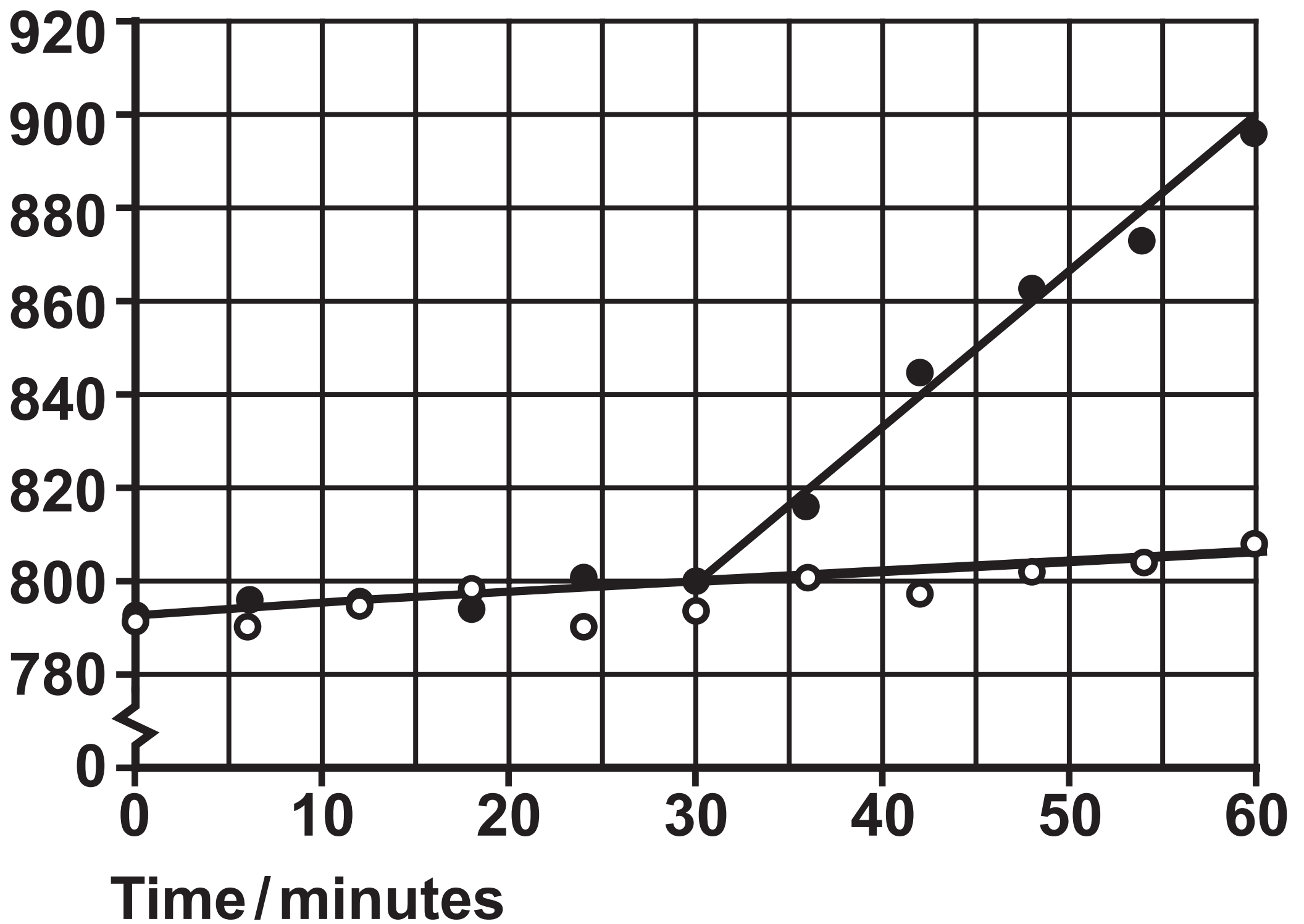


Question 1(b)

KEY

—●— Buffer with IAA

—○— Buffer only

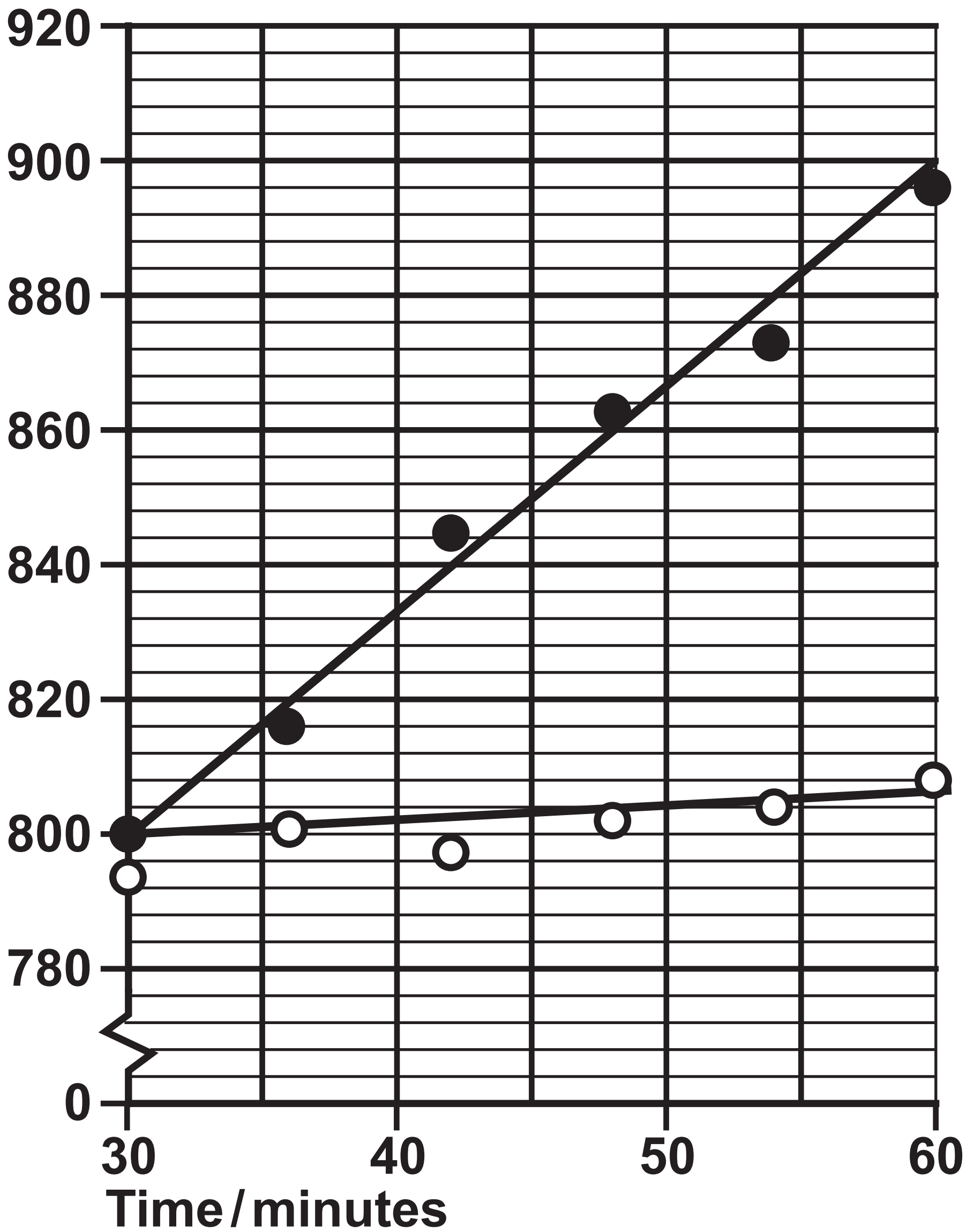
Mean cell length / μm 

Question 1(b)(ii)

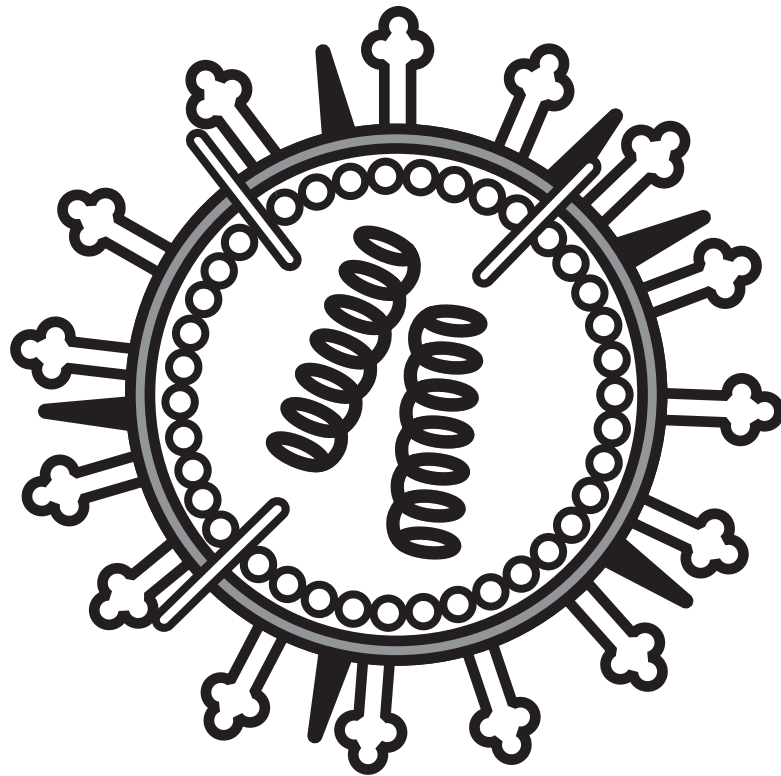
KEY

—●— Buffer with IAA

—○— Buffer only

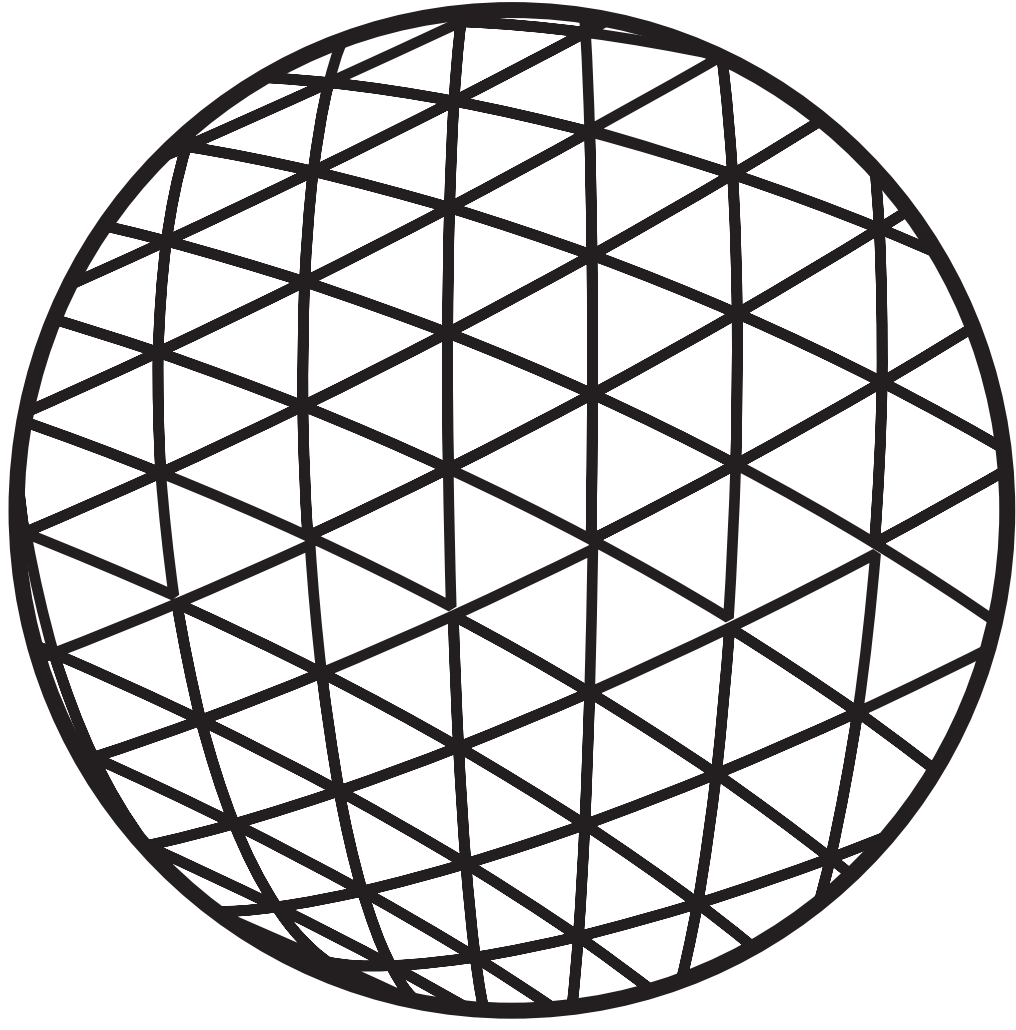
Mean cell length / μm 

Question 2



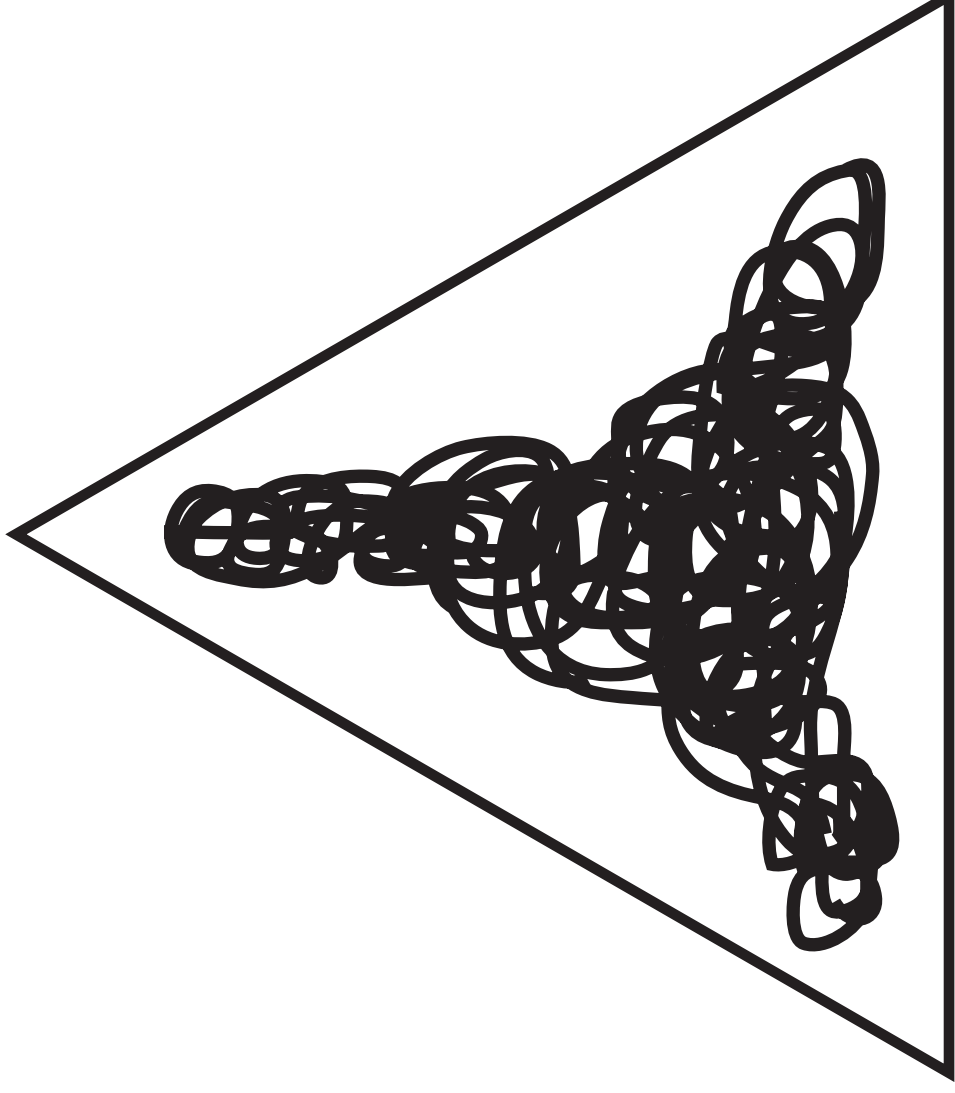
Question 2(b)

Diagram of the surface of the virus showing each spike protein as a triangle



240 nm

The diagram shows the area occupied by one spike protein

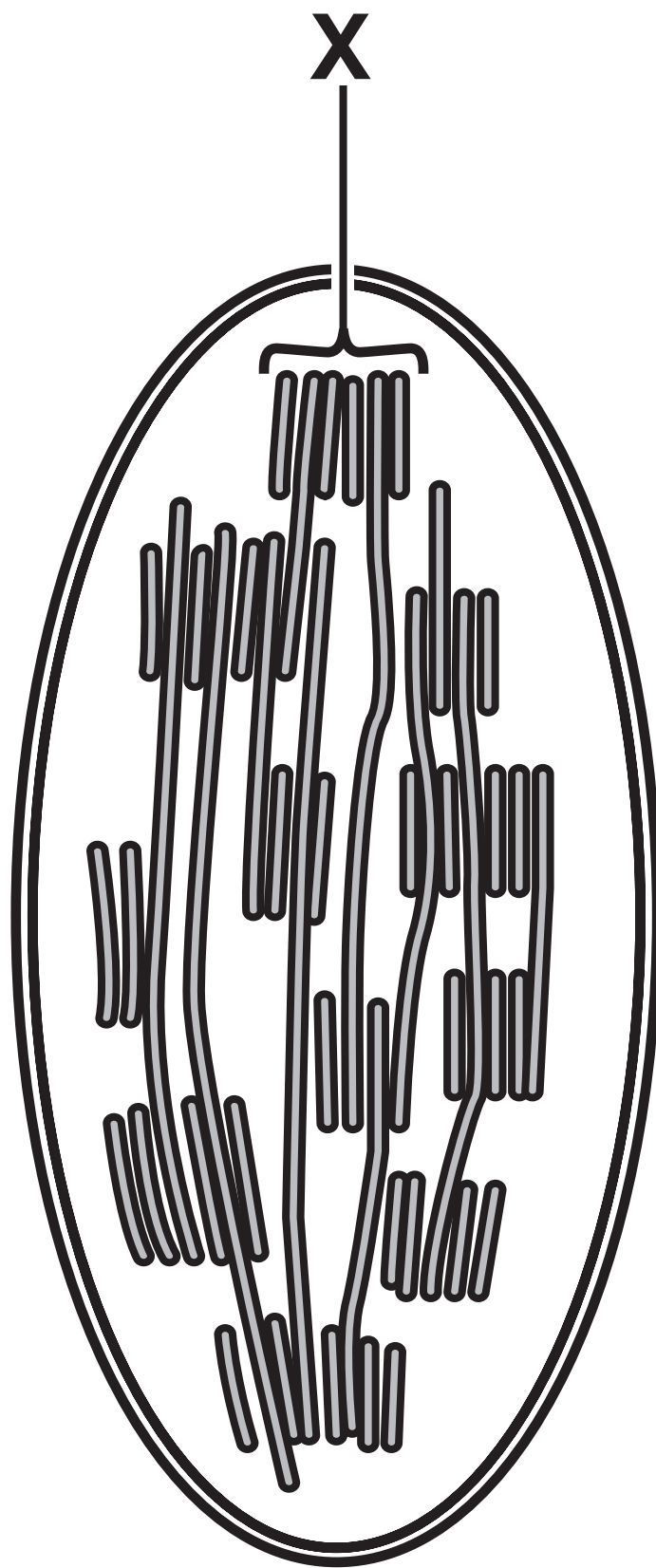


$h = 22.4 \text{ nm}$

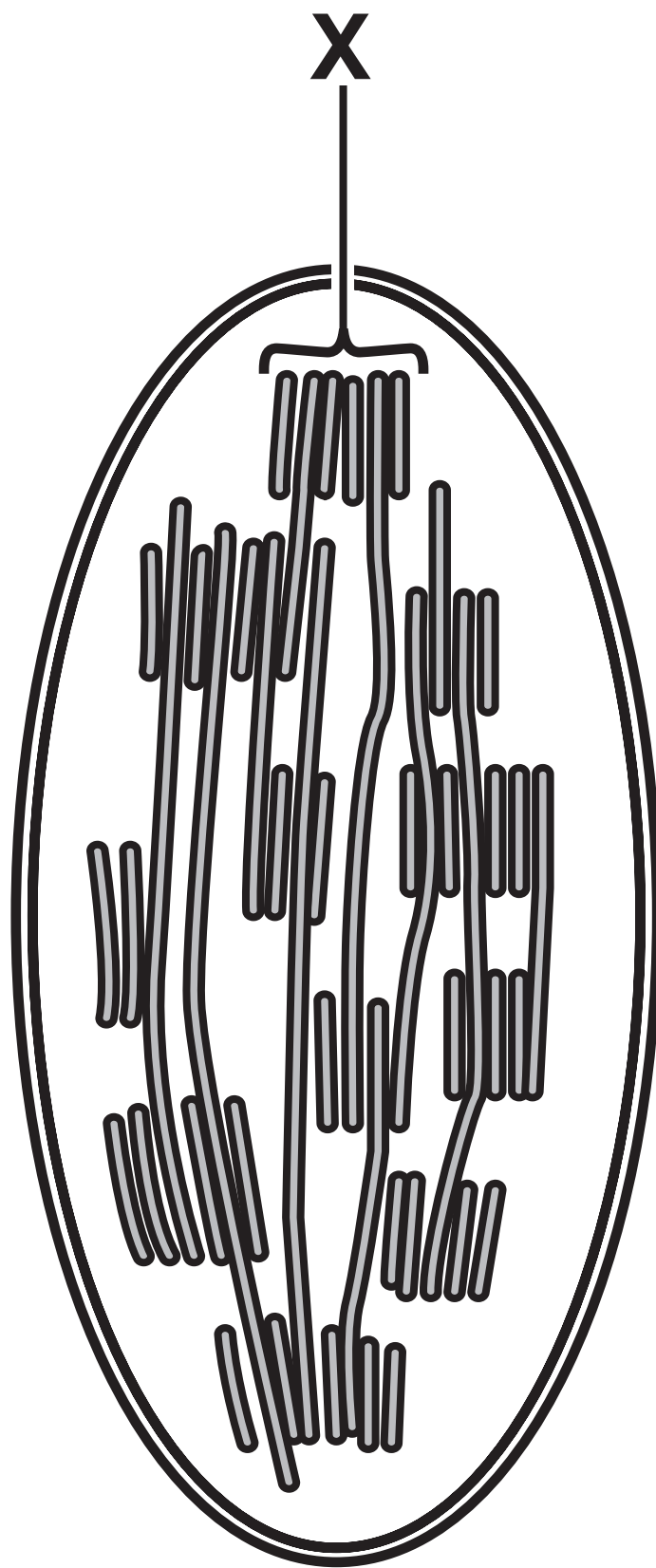
$b = 20.0 \text{ nm}$

10

Question 3(a)



Question 3(a)



Question 3(b)

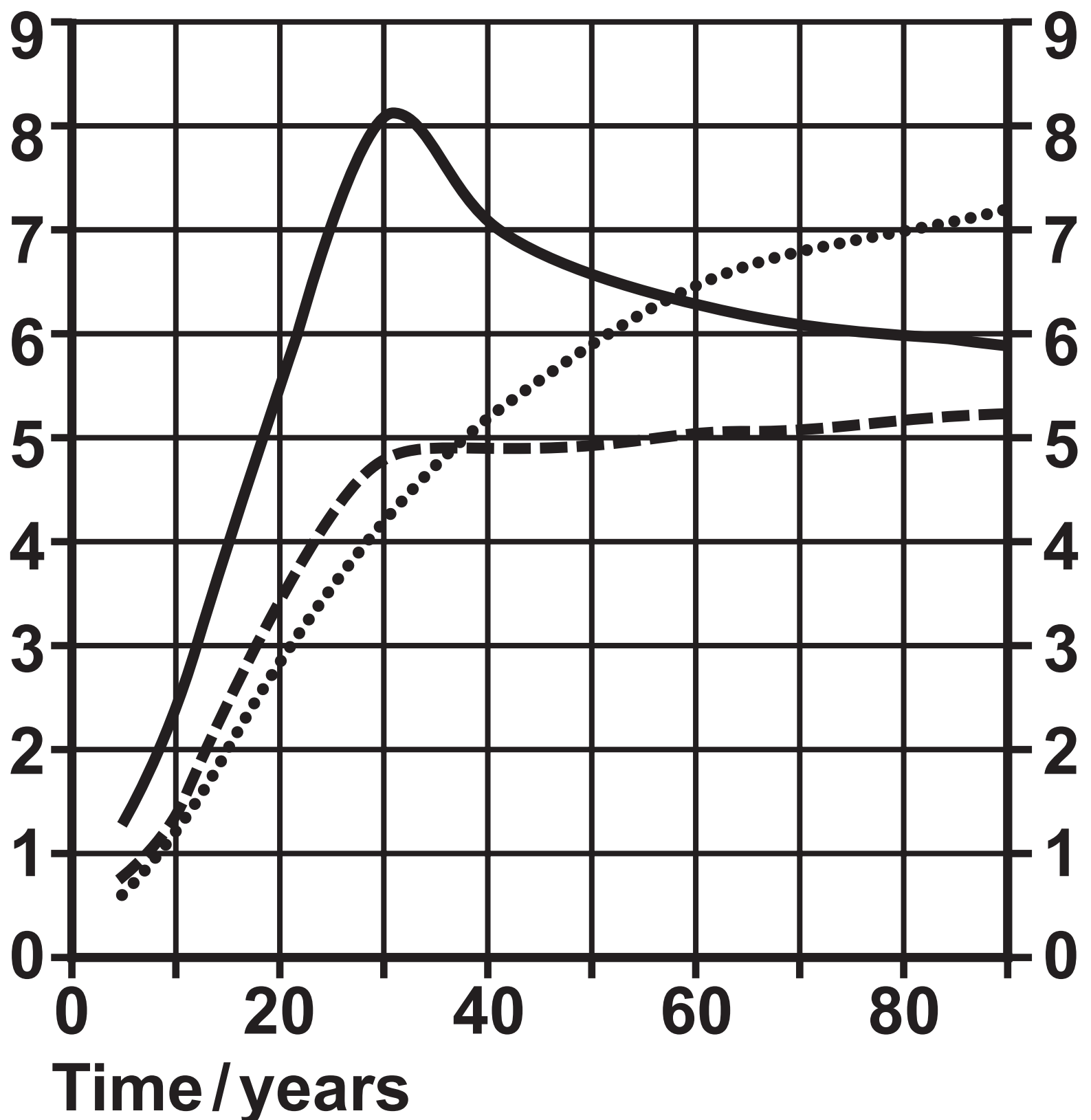
KEY

..... biomass

— gross primary productivity

---- respiration

Energy/a.u.



Question 3(b)

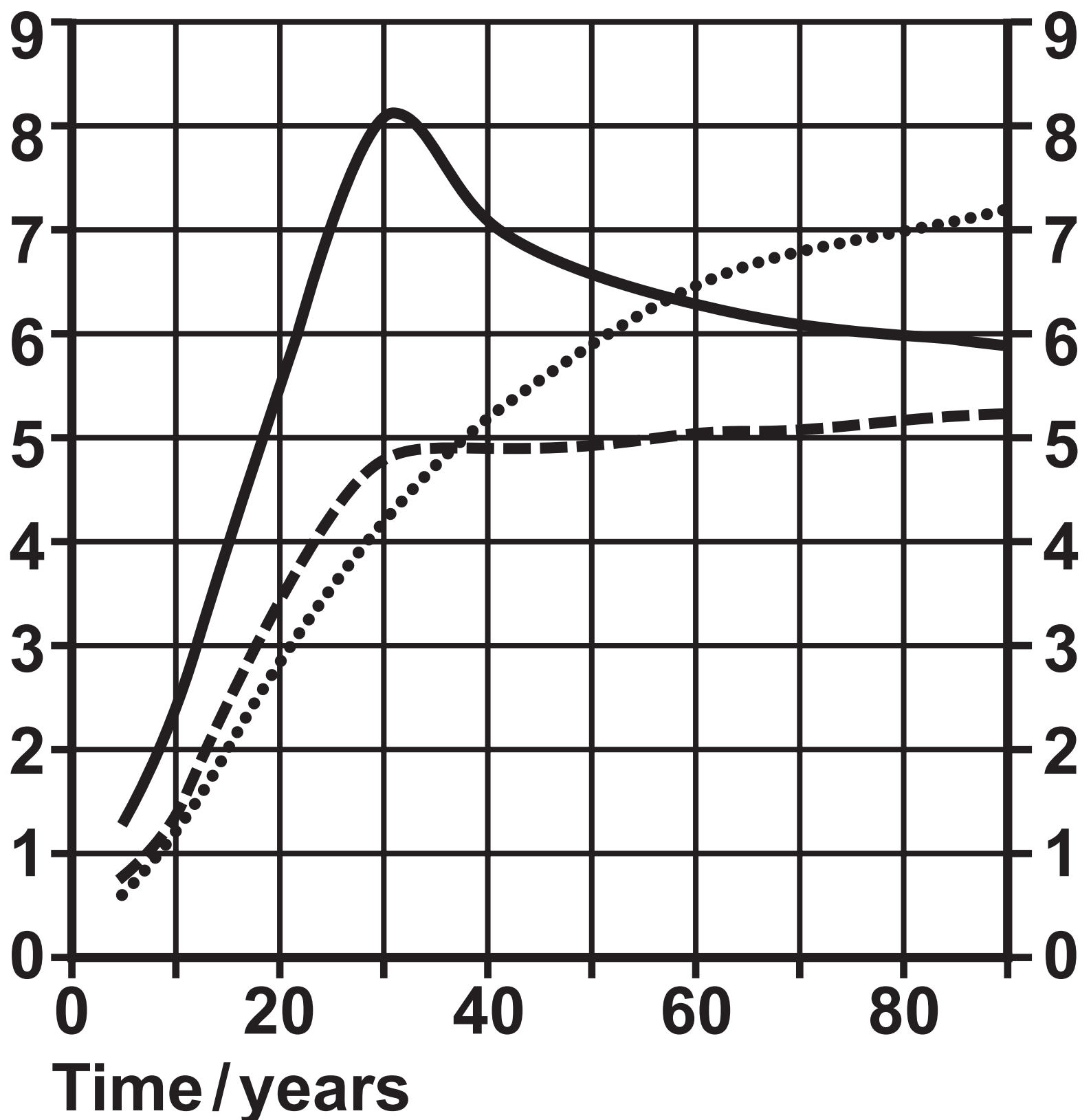
KEY

..... biomass

— gross primary productivity

---- respiration

Energy/a.u.



14

Question 4(b)

Solvent used to prepare extract	Dry mass of extract / µg	Bacteria tested	
		Klebsiella pneumoniae (Gram negative)	Micrococcus luteus (Gram positive)
		Mean diameter of the zone of inhibition / mm	
A	5·0	8·3	7·1
	10·0	10·5	7·0
B	5·0	14·5	12·2
	10·0	18·1	18·0

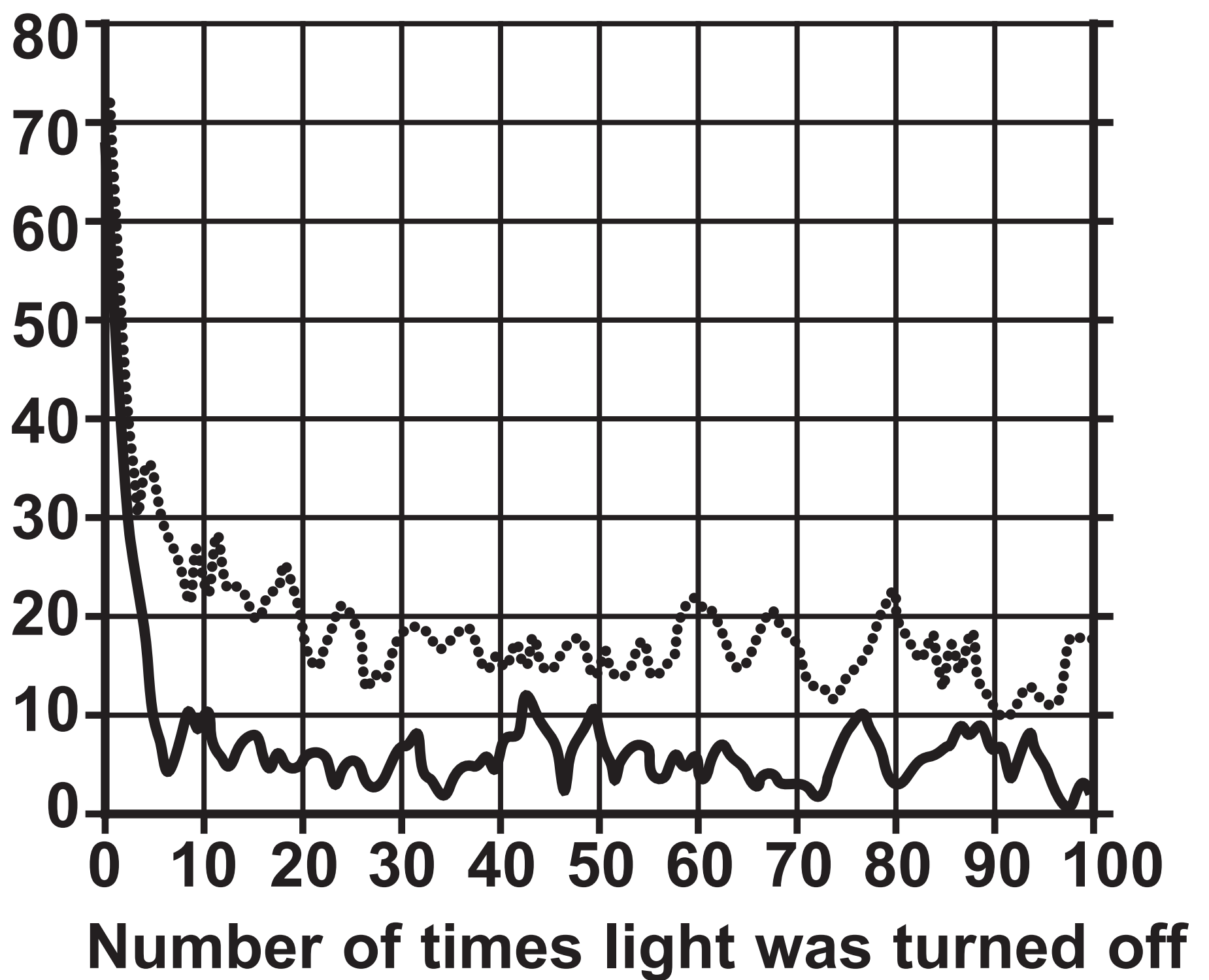
Question 5(b)

KEY

..... reduced synapsin

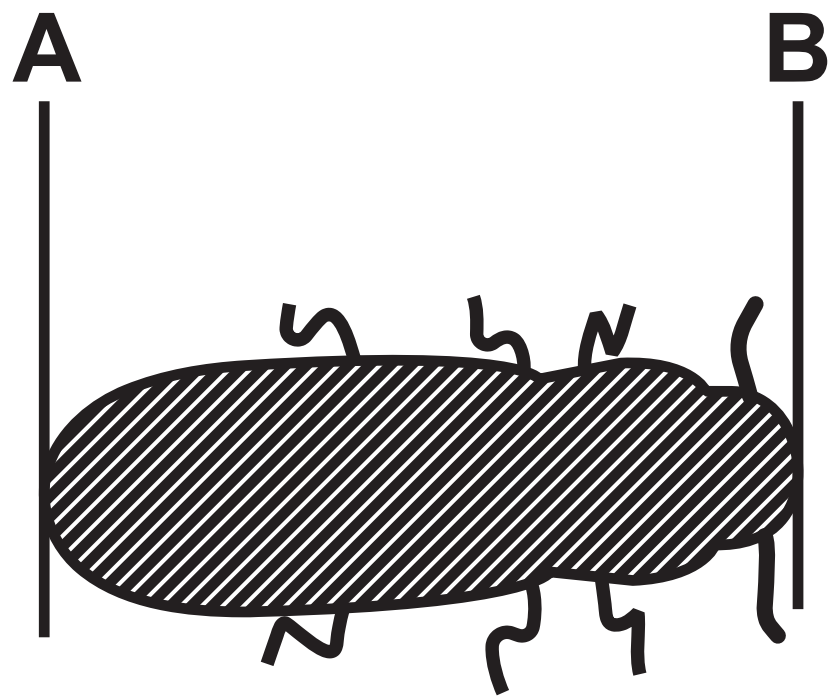
— normal synapsin

Mean percentage of maximum
jump response (%)



16

Question 6



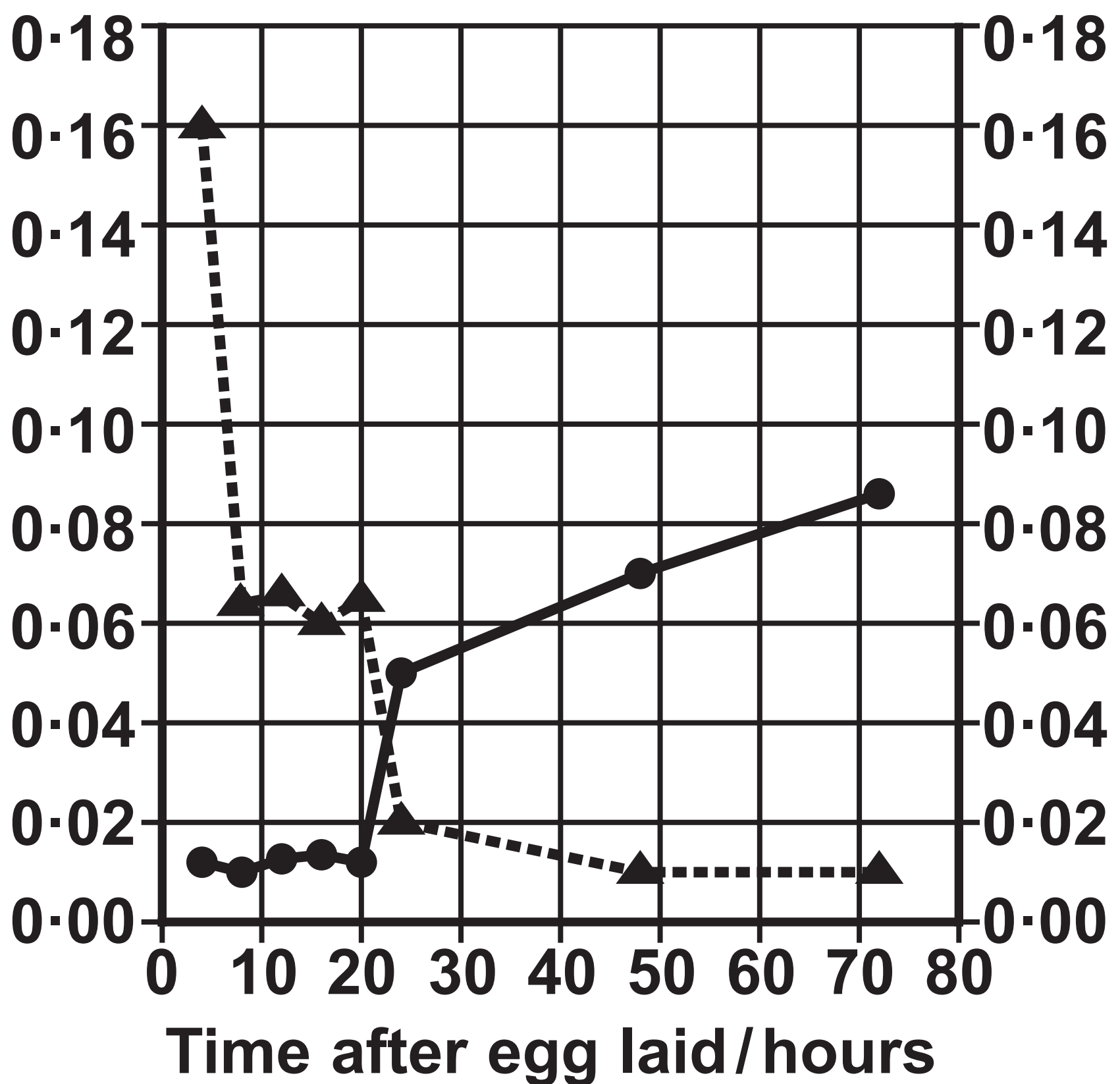
magnification $\times 30$

Question 6(c)

KEY

—●— glucose

- -▲- - glycogen

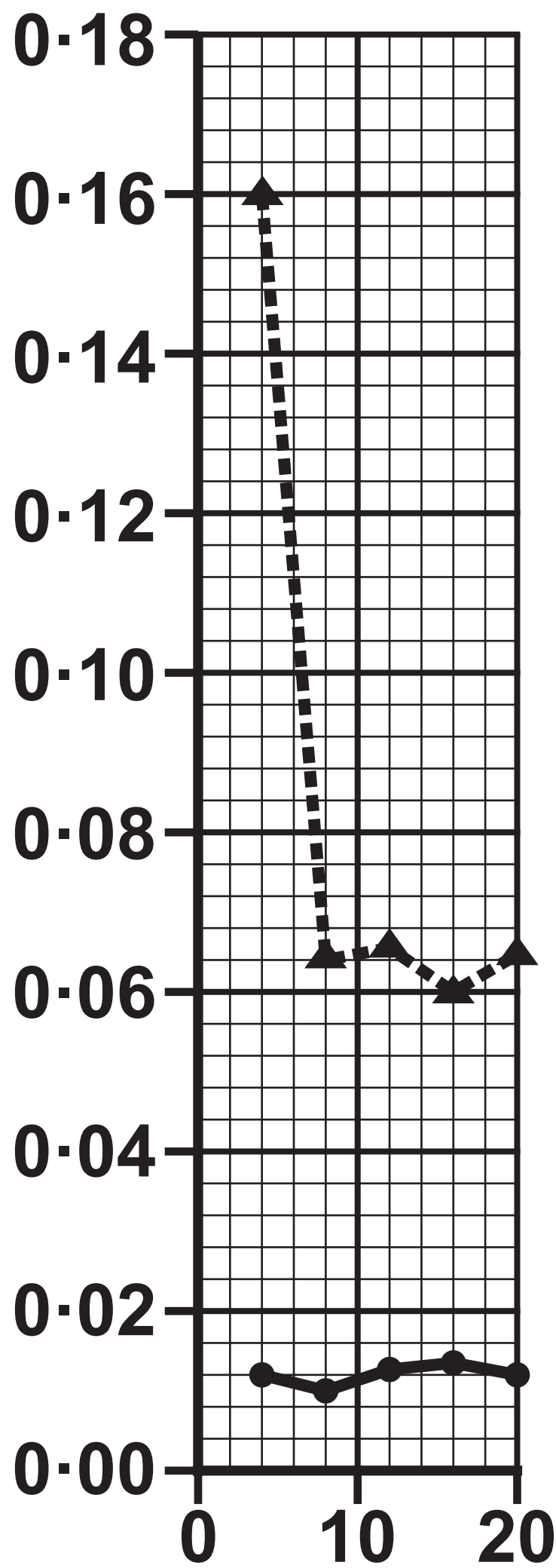
Mass per egg/ μg 

Question 6(c)(i)

KEY

—●— glucose

- - ▲ - - glycogen

Mass per egg / μg 

Time after egg laid / hours

Question 7

Functions	Proportion of proteins
Enzymes	41%
Receptors and control of receptor activity	11%
Carrier and transporter	17%
Communication and signalling inside cells	10%
Transcription factors and other nucleic acid binding molecules	20%
Defence	1%

Question 7

TABLE 1

Property of the side chain group	Number of amino acids with the property
Non-polar	9
Polar, uncharged	6
Negatively charged	3
Positively charged	2

Question 7

TABLE 2

Amino acid	Comment on structure
Cysteine	The side chain contains a thiol group (-S-H) that is chemically reactive.
Glycine	The side chain is a hydrogen atom which is much smaller than any other side chain. This allows tight coiling of polypeptide chains.
Proline	The side chain forms a peptide bond with the nitrogen in the amino group. This makes a polypeptide chain more rigid.

Source Information

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