This is a Class 1 exam

Lebanon Evangelical School for Boys and Girls

Lebanon Evangelical School
for Boys and Girls Loueizeh - Baabda

Stage Exam 01

17FEB2025

Do NOT write in this box. Your MARK will be placed here.

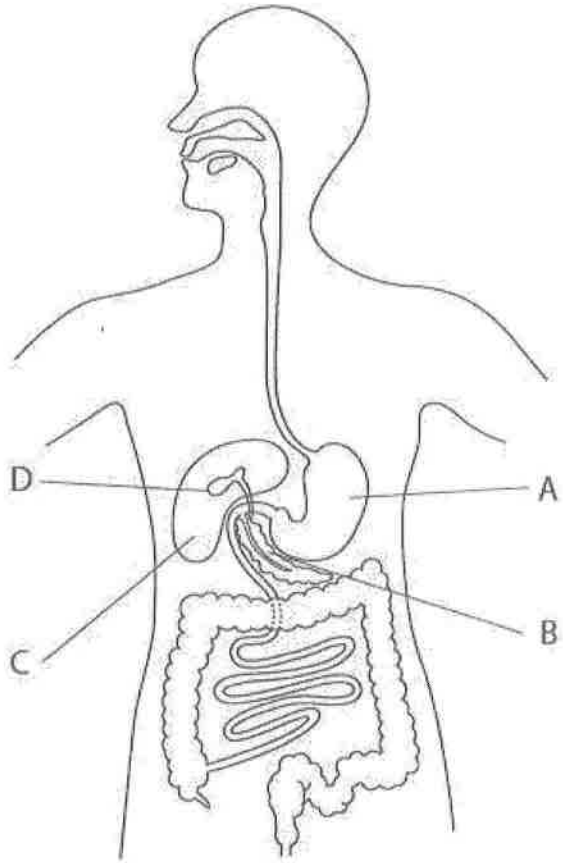
Subject :	Biology
Class :	9A
Teacher :	Miss Rahmeh Hilal
Duration :	1 hour
You are to answer the questions to this exam on : This exam paper	

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.

Q1.

The diagram shows the human alimentary canal.



(a) (i) Explain how food passes down the oesophagus.

(2)

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(ii) Which labelled structure produces bile?

(1)

- ☐ A
- ☐ B
- ☐ C
- ☐ D

(iii) Describe the role of bile in digestion.

(3)

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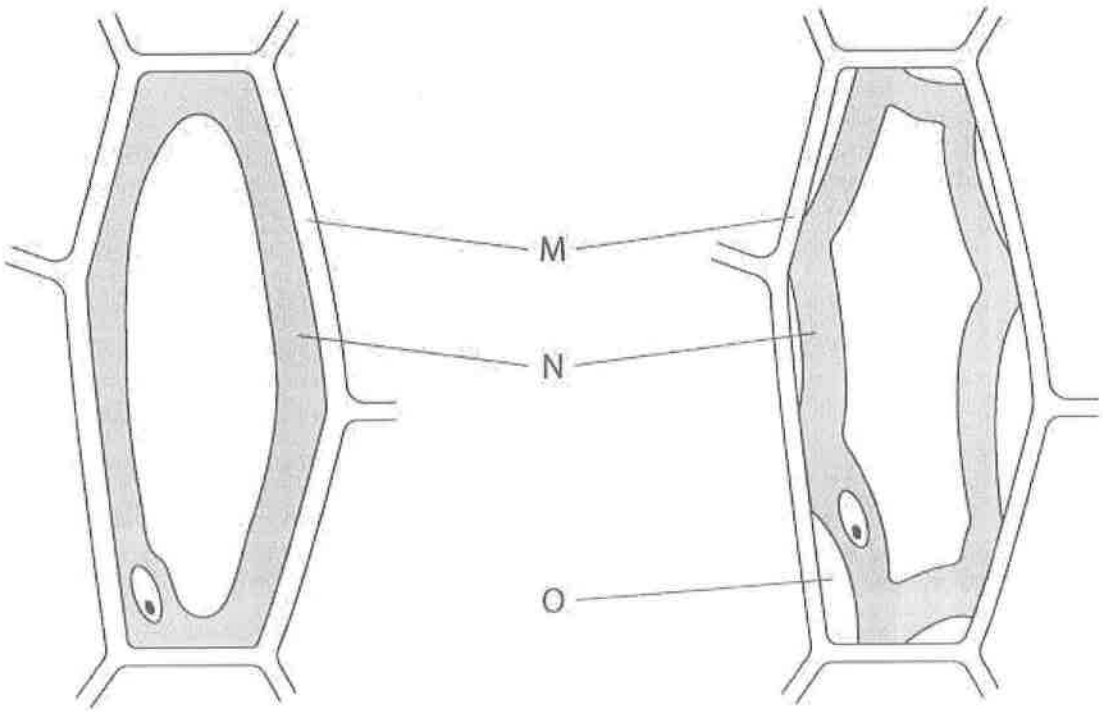
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(Total for question = 6 marks)

Q2.

The diagram shows a plant cell in distilled water and a plant cell in a concentrated solution of sodium chloride.



Cell in distilled water

Cell in concentrated solution of sodium chloride

(a) (i) Which structure is labelled M?

(1)

- ☒ **A** cell membrane
- ☒ **B** cell wall
- ☐ **C** nucleus
- ☒ **D** vacuole

(ii) Which structure is labelled N?

(1)

- ☒ **A** cell membrane
- ☒ **B** cell wall
- ☐ **C** cytoplasm
- ☐ **D** vacuole

(b) (i) Give the name of the liquid found in the gap labelled O in the cell in the concentrated solution of sodium chloride.

(1)

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(ii) Explain the differences in the appearance of the cell in distilled water and the cell in the concentrated solution of sodium chloride.

(4)

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(Total for question = 7 marks)

Q3.

All living organisms have certain characteristics.

(a) Describe what is meant by the following characteristics:

(i) respiration

(2)

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(ii) control of their internal conditions

(2)

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(b) Organisms are organised into different levels.

What is the correct order of the levels?

(1)

- ☐ **A** organ, system, tissue, cell, organelle
- ☐ **B** organ, tissue, cell, system, organelle
- ☐ **C** organelle, cell, tissue, organ, system
- ☐ **D** system, cell, organelle, organ, tissue

(c) Yeast is an example of which group of organism?

(1)

- ☐ **A** animals
- ☐ **B** bacteria
- ☐ **C** fungi
- ☐ **D** protoctists

(Total for question = 6 marks)

Q4.

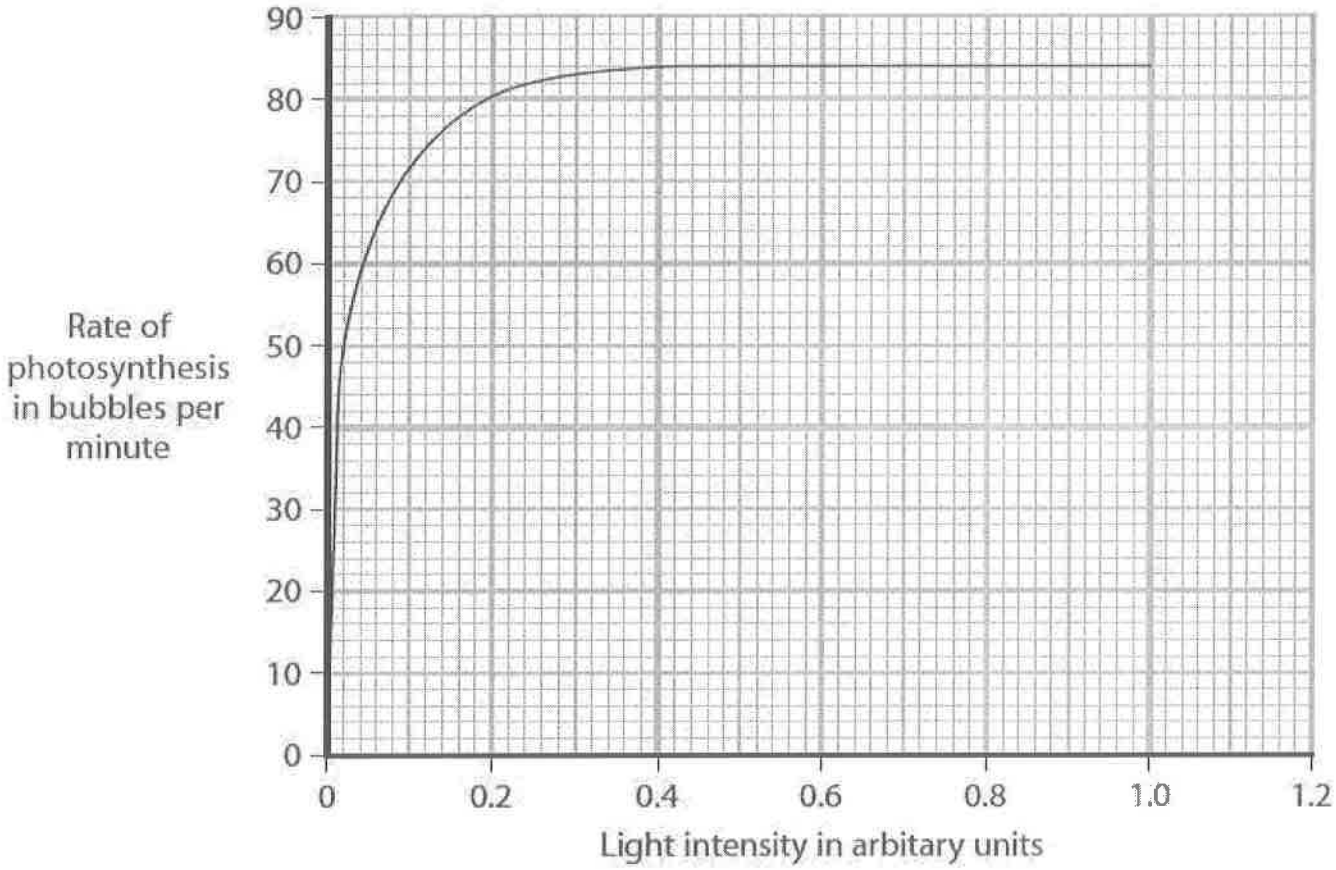
Plants need light for photosynthesis.

(a) Give the balanced chemical symbol equation for photosynthesis.

(2)

..... + ... ⟶ ..... + ...

(b) The graph shows the effect of light intensity on the rate of photosynthesis in a water plant.



The rate of photosynthesis is measured by counting the number of bubbles of gas released per minute.
The light intensity is decreased by moving a lamp further away from the water plant.
The light intensity is calculated as

$$= 1 \div (\text{distance in cm of lamp from plant})^2$$

(i) Using information from the graph, calculate the distance of the lamp from the plant when the rate of photosynthesis is 78 bubbles per minute.

(2)

distance = ... cm

(ii) Describe the relationship between the number of bubbles per minute and light intensity.

(3)

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(iii) Explain the rate of photosynthesis between a light intensity of 0.4 arbitrary units and a light intensity of 0.8 arbitrary units.

(2)

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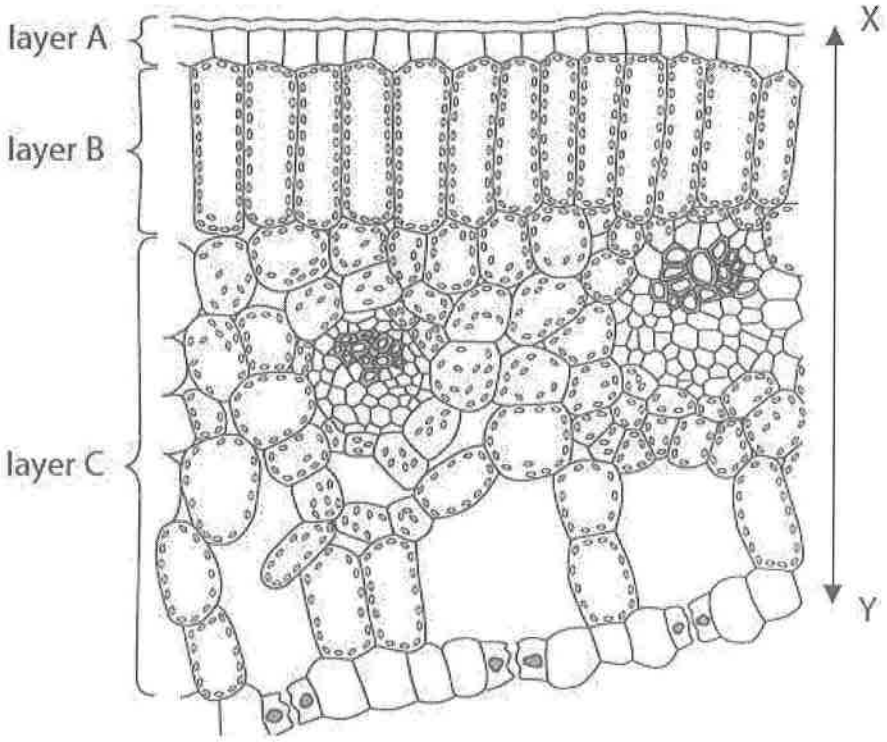
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(Total for question = 9 marks)

Q5.

The diagram shows a cross-section through a leaf.



(a) The actual thickness of the leaf, from X to Y, is 1100 μm.

[1 mm = 1000 μm]
Determine the magnification of the diagram.

(3)

magnification = ...

(b) Describe the differences between layer B and layer C.

(3)

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(c) Explain how layers A and B are adapted for their function.

(5)

A .....

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B .....

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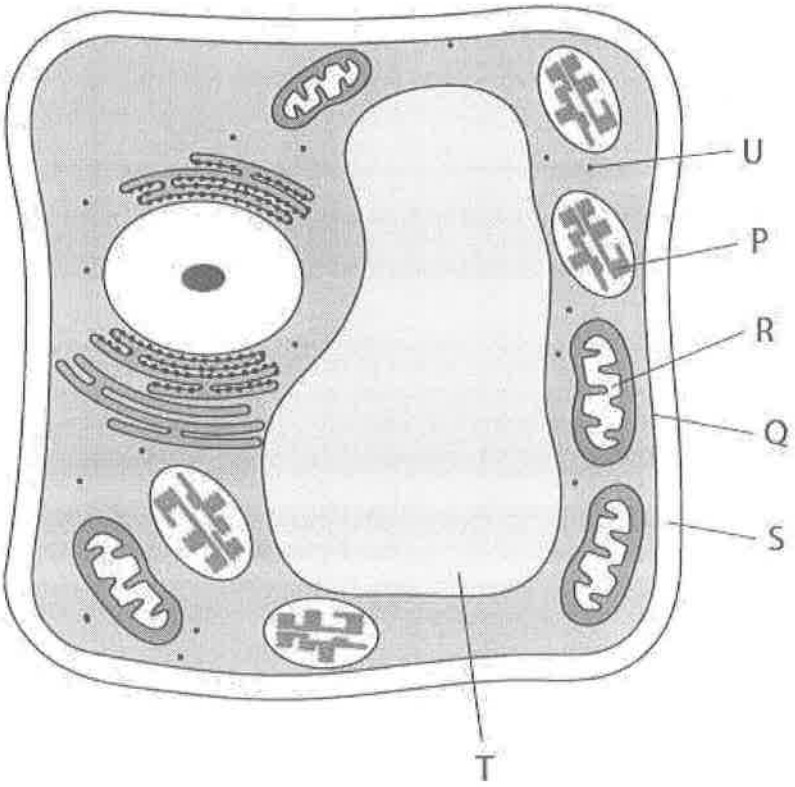
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(Total for question = 11 marks)

Q6.

The diagram shows a plant cell with some structures labelled.



(a) (i) Which structure is the cell vacuole?

(1)

- ☐ **A** P
- ☐ **B** R
- ☐ **C** S
- ☐ **D** T

(ii) Which structure is the site of photosynthesis?

(1)

- ☐ **A** P
- ☐ **B** Q
- ☐ **C** R
- ☐ **D** T

(iii) Structure U is the site of protein synthesis in the cell.
What is the name of structure U?

(1)

- ☐ **A** chloroplast
- ☐ **B** mitochondrion
- ☐ **C** ribosome
- ☐ **D** starch granule

(b) A cell is shaped like a cube.

Each side has a length of 0.053 mm.
Calculate the surface area to volume ratio of this cell.
Give your answer in the form n : 1

(3)

surface area to volume ratio = ... : 1

(c) Animal cells, unlike plant cells, do not have a cell wall.

(i) Explain how this difference affects red blood cells when placed in distilled water.

(3)

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(ii) Explain how this difference affects red blood cells when placed in a concentrated salt solution.

(2)

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(Total for question = 11 marks)

Q1.

Question Number	Answer	Mark
(a)(i)	An explanation that makes reference to the following: • peristalsis (1) • (waves of) muscular contractions (1)	2

Question Number	Answer	Mark
(a)(ii)	C liver A is incorrect because bile is not made in the stomach B is incorrect because bile is not made in the pancreas D is incorrect because bile is not made in the gall bladder	1

Question Number	Answer	Mark
(a)(iii)	An explanation that makes reference to three of the following: • bile neutralises stomach acid / food / chyme / eq (1) • to set the optimum pH for enzymes (1) • bile emulsifies fats / breaks up fats into smaller droplets / eq (1) • to increase the surface area (for digestion) (1)	3

Q2.

Question Number	Answer	Mark
(a)(i)	The only correct answer is B M is the cell wall. A is not the answer as M is not the cell membrane C is not the answer as M is not the nucleus D is not the answer as M is not the vacuole	1

Question Number	Answer	Mark
(a)(ii)	The only correct answer is C N is the cytoplasm. A is not the answer as N is not the cell membrane B is not the answer as N is not the cell wall D is not the answer as N is not the vacuole	1

Question Number	Answer	Mark
(b)(i)	• sodium chloride (solution) / salt solution / bathing solution / eq (1)	1

Question Number	Answer	additional guidance	Mark
(b)(ii)	An explanation that makes reference to four of the following in distilled water • water enters cell / eq(1) • by osmosis (1) • from dilute solution to more concentrated solution / from high(er) water potential to low(er) water potential / water / outside has a higher water potential / eq (1) • cytoplasm pushed against cell membrane/ cell wall / eq (1) • cell is turgid / (1)	allow converse for cell in salt solution water exits allow as salt soln / outside has lower water potential allow high conc of water to low conc of water .cytoplasm /cell membrane shrinks away . cell plasmolysed / flaccid	4

Q3.

Question number	Answer	Additional guidance	Mark
(a)(i)	A description that makes reference to the following two points: • release of energy (1) • within cells (1)	reject production of energy	2

Question number	Answer	Additional guidance	Mark
(a)(ii)	A description that makes reference to the following points: • keeping named characteristic, e.g. temperature (1) • constant within narrow range (1)	allow blood glucose/carbon dioxide/blood pressure/water content/equivalent	2

Question number	Answer	Mark
(b)	C	1

Question number	Answer	Mark
(c)	C	1

Q4.

Question Number	Answer	additional guidance	Mark
(a)	$6CO_2 + 6H_2O \longrightarrow C_6H_{12}O_6 + 6O_2$ (2)	allow 1 mark for correct formula but incorrect balance no credit for word equation	2

Question Number	Answer	additional guidance	Mark
(b)(i)	Calculation 78 bubbles per minute gives $1 \div d^2$ value from x axis of 0.16 therefore $1 \div d^2 = 0.16$ $d^2 = 6.25$ distance d = 2.5 (cm) (2)	Graph clearly 0.16 allow 1 mark for 0.16 or 6.25	2

Question Number	Answer	Mark
(b)(ii)	A description that makes reference to the following • more bubbles released / rate of photosynthesis increases / eq (1) • very steeply at low light intensities / at first / eq (1) • number of bubbles levels off / becomes constant / stays same / reaches maximum / rate of increase slows down / eq (1)	3

Question Number	Answer	Additional guidance	Mark
(b)(iii)	An explanation that makes reference to two of the following • rate doesn't change / no change / increasing / changing light / light intensity / has no effect / / eq (1) • as light **no** longer / **not** limiting factor / other factor limiting / eq (1) • need more carbon dioxide / need higher temperature to increase photosynthesis rate / eq (1)	No credit for light is limiting factor carbon dioxide / chlorophyll is limiting factor / temperature limiting factor **scores mp 2 and mp 3**	**2**
			Total 9 marks

Q5.

Question Number	Answer	additional guidance	Mark
(a)	• measurement of XY in mm • conversion of mm into µm • divide image size by actual size 63.6 / 63.63 etc / 64 (3) **allow any value between 61.8- 66 for 3 marks**	70 mm 70 x 1000 = 70 000 70 000 ÷ 1100 **allow 1 mark for correct measurement 68 -72 (no units) or 6.8 - 7.2 cm** **and** **allow 1 mark for x 1000 or ÷ 1000** **OR** **one mark for dividing by 1100** **so correct measurement and x 1000 = 2 marks eg 68000 - 72000**	3

Question Number	Answer	additional guidance	Mark
(b)	A description that incudes three of the following :	converse for C	3
	• B near upper surface / B nearer sunlight / eq (1)	C nearer lower surface/eq	
	• B layer one cell thick / B smaller / / eq (1)	C several cells thick/ C larger/eq	
	• B closely packed / /eq (1)	C spaced /(air) spaces/ spongy/eq	
	• B many chloroplasts / eq (1)	C fewer chloroplasts/eq	
	• B rectangular shape / B only one type / / eq (1)	C spherical / rounded / different cell types/eq	
	• B no veins / B no xylem / B no phloem / eq (1)	C veins/ vascular bundles / xylem / phloem/eq	

Question Number	Answer		Mark
(c)	An explanation that makes reference to five of the following points: 1. A / waxy cuticle to prevent evaporation of water /eq (1) 2. A / waxy cuticle prevents entry of bacteria / virus/ / fungi / pathogen / eq (1) 3. A / epidermis transparent / allows light to pass through / in eq / (1) 4. B / palisade mesophyll (cells) contain chloroplasts / chlorophyll to absorb light / eq (1) 5. B / palisade mesophyll (cells) / arranged vertically to absorb light /eq (1) 6. B / palisade mesophyll (cells) near upper surface for more light / to absorb light / eq (1) 7. B / palisade mesophyll packed tightly to absorb light / eq (1) 8. B contains veins/xylem/ vascular bundle / to bring water/eq (1) 9. B / for photosynthesis (1)	not entry of organisms contain chloroplasts for photosynthesis = mp 9 only allow near to sunlight	5
		Total = 11 marks	

Q6.

Question Number	Answer	Mark
(a)(i)	The only correct answer is D T is the vacuole A is not the answer as P is not the vacuole B is not the answer as R is not the vacuole C is not the answer as S is not the vacuole	1

Question Number	Answer	Mark
(a)(ii)	The only correct answer is A P is the site of photosynthesis B is not the answer as Q is not the site of photosynthesis C is not the answer as R is not the site of photosynthesis D is not the answer as T is not the site of photosynthesis	1

Question Number	Answer	Mark
(a)(iv)	The only correct answer is C U is the ribosome is the site of protein synthesis A chloroplast is not the site of protein synthesis B mitochondrion not the site of protein synthesis D starch granule is not the site of protein synthesis	1

Question Number	Answer	Additional guidance	Mark
(b)	Volume = 0.053 × 0.053 × 0.053 = 0.000 148 877 or 0.00015 SA = 6 × 0.053 × 0.053 = 0.016 854 or 0.017 SA to volume = 0.016 854/ 0.000 148 877 113.21 or 113.2 or 113.33 or 113.3 (to 1)	**allow full marks for correct answer no working** **allow 1 mark for SA** 0.016 854 or 0.017 or other dec places in std form such as 1.7×10^{-2} **allow 1 mark for Vol** 0.000 148 877 or 0.00015 or other dec places or in std form such as 1.5×10^{-4} Accept 113 (to 1) 110 (to 1) as 110 is 2 sig figs same as data	3

Question Number	Answer	Additional guidance	Mark
(c)(i)	An explanation that makes reference to three of the following • water enters cell due to <u>osmosis</u> / eq (1) • correct ref to water potential (high to low water potential (gradient) /low (solute) concentration to higher (solute) concentration / low water potential in cell / high water potential outside / eq (1) • as cannot prevent expansion / (keeps) expanding / expands / swells /eq (1) • animal cells / blood cells burst / eq (1)	allow from high concentration of water to lower concentration	3

Question Number	Answer	Additional guidance	Mark
(c)(ii)	An explanation that makes reference to two of the following • water leaves cell due to <u>osmosis</u> / eq (1) • correct ref to water potential (high to low water potential (gradient) /low (solute) concentration to higher (solute) concentration / low water potential outside cell / high water potential inside / eq(1)	allow from high concentration of water to lower concentration **ignore flaccid**	2
	• animal cells / blood cells crenate / collapse / shrivel / eq (1)	**reject plasmolysed**	

Total 12 marks