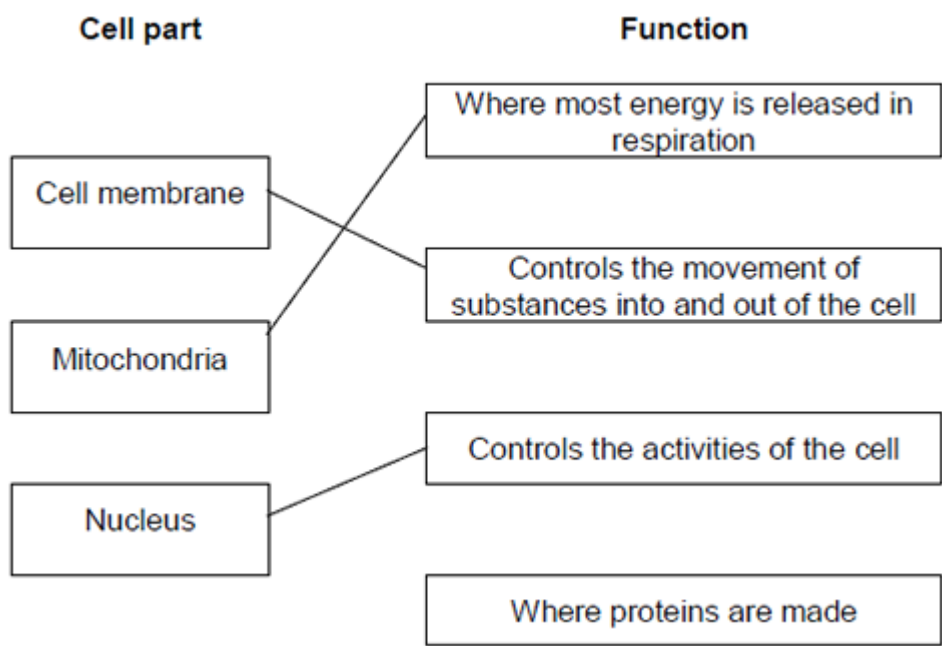


M1.(a)



extra lines cancel

3

(b) Cell wall

in either order

1

Chloroplast

allow (permanent) vacuole

1

[5]

M2.(a) (i) A = nucleus

1

B = (cell) membrane

1

(ii) any **two** from:
ignore shape

- no (cell) wall
- no (large / permanent) vacuole
- no chloroplasts / chlorophyll

2

- (b) because high to low oxygen / concentration **or** down gradient
allow 'more / a lot of oxygen molecules outside'
ignore along / across gradient

1

- (c) a tissue

1

[6]

- M3.** (a) (i) makes / produces / synthesises protein / enzyme

1

- (ii) plant cell has nucleus / vacuole / chloroplasts / chlorophyll
or plant cell is much larger
'It' = plant cell
allow correct reference to DNA or chromosomes
allow plant cell has fewer ribosomes
allow cellulose (cell wall)

1

- (b) (i) 200

correct answer with or without working gains 2 marks

*if answer incorrect, allow 1 mark for $\frac{2 \times 50,000}{500}$ **or** $\frac{100,000}{500}$ **or** 100*

2

- (ii) bacterial cell is too small / bacterial cell about same size as a mitochondrion / 'no room'

ignore references to respiration

1

[5]

M4.(a) contract / shorten

ignore relax

*do **not** allow expand*

1

to churn / move / mix food

accept peristalsis / mechanical digestion

ignore movement unqualified

1

(b) 400

acceptable range 390-410

allow 1 mark for answer in range of 39 to 41

allow 1 mark for answer in range of 3900 to 4100

2

(c) to transfer energy for use

allow to release / give / supply / provide energy

*do **not** allow to 'make' / 'produce' / 'create' energy*

allow to make ATP

ignore to store energy

1

by (aerobic) respiration **or** from glucose

*do **not** allow anaerobic*

*energy released **for** respiration = max 1 mark*

1

- (d) (i) to make protein / enzyme
ignore 'antibody' or other named protein
 1
- (ii) too small / very small
allow light microscope does not have sufficient magnification / resolution
allow ribosomes are smaller than mitochondria
ignore not sensitive enough
ignore ribosomes are transparent
 1
- [8]**

- M5.(a)** (i) nucleus
 1
- (ii) diffusion
 1
- (b) increases / larger surface area (for diffusion)
ignore large surface area to volume ratio
 1
- (c) (i) sugar / glucose
accept amino acids / other named monosaccharides
 1
- (ii) against a concentration gradient
or
 from low to high concentration
 1
- (iii) (active transport requires) energy
 1
- (from) respiration
 1
- (d) minerals / ions
accept named ion ignore nutrients

do not accept water

1

[8]

M6.(a) B

*no mark for "B" alone, the mark is for B **and** the explanation.*

large(r) surface / area **or** large(r) membrane

accept reference to microvilli

ignore villi / hairs / cilia

accept reasonable descriptions of the surface eg

folded membrane / surface

*do **not** accept wall / cell wall*

1

(b) (i) any **one** from:

- (salivary) amylase
- carbohydrase

1

(ii) many ribosomes

*do **not** mix routes. If both routes given award marks for the greater.*

1

ribosomes produce protein

accept amylase / enzyme / carbohydrase is made of protein

or

(allow)

many mitochondria (1)

mitochondria provide energy to build / make protein (1)

accept ATP instead of energy

1

[4]

- M7.** (a) (i) water (molecules) enter(s) (the cell)
or water (molecules) pass(es) through the (semi-permeable) cell membrane
 1
- by osmosis
or because the concentration of water is greater outside (the cell than inside it the vacuole)
accept because of the concentration gradient provided there is no contradiction
 1
- (ii) any **one** from
 (it is) elastic
 (it is) strong
 (it is fully) permeable (to water)
or water can pass through it
do not credit semi-permeable
do not credit cell membrane is semi-permeable
 1
- (b) (the piece of) potato shrinks
or loses its turgor
or becomes flabby
or becomes flaccid
or plasmolysis occur
or cytoplasm pulls away from the cell wall
 (because) concentration of sugar
or because concentration of water
 1
- (solution) is greater than concentration inside the cell / vacuole
inside the cell / vacuole is greater than concentration (of water) outside
 1
- water is drawn out of the cell
 1

M8. (a) (i) diffusion is down the concentration gradient

for a description of diffusion

ignore along / across gradients

1

to enter must go up / against the concentration gradient

accept by diffusion ions would leave the root

or

concentration higher in the root / plant

or

concentration lower in the soil

1

(ii) active transport

allow active uptake

1

(b) (i) (root hairs →) large surface / area

1

(ii) (aerobic) respiration

*do **not** allow anaerobic*

1

releases / supplies / provides / gives energy

accept make ATP (for active transport)

*do **not** allow 'makes / produces / creates' energy*

1

- (iii) starch is energy source / store (for active transport)
allow starch can be used in respiration
*do **not** allow 'makes / produces / creates' energy*

1

[7]