

Mark schemes

1

(a) any **two** from:

- carbon dioxide / CO₂
- urea
- protein
- water / H₂O
- hormones / insulin.

ignore food / waste / alcohol / drugs / enzymes

ignore glucose and oxygen

*allow **two** correct hormones for 2 marks*

*allow **two** correct food components for 2 marks*

allow antibodies

allow antitoxins

2

(b) (i) plasma

1

platelets

1

(ii) (cardiac) muscle

allow muscular

1

(c) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also refer to the information in the Marking Guidance and apply a 'best-fit' approach to the marking.

0 marks

No relevant content

Level 1 (1–2 marks)

There is a description of at least one advantage of the cow tissue valve

or

a description of at least one disadvantage of the cow tissue valve.

Level 2 (3–4 marks)

There is a description of at least one advantage of the cow tissue valve

and

at least one disadvantage of the cow tissue valve.

Level 3 (5–6 marks)

There is a description of the advantages and disadvantages of the cow tissue valve

or

a description of several advantages of the cow tissue valve and at least one disadvantage.

Examples of the points made in the response

Advantages of cow tissue valve:

- abundant supply of cows
- so shorter waiting time
ignore can take many years to find a suitable human donor
- no need for tissue typing
- quicker operation
- less invasive **or** shorter recovery time
- cheaper operation costs
- less operation / anaesthetic risks.

Disadvantages of cow tissue valve:

- made from cow so possible objections on religious grounds
ignore ethical arguments
- new procedure so could be unknown risks
allow possible transfer of disease from cow
- risks of using a stent eg. blood clots, stent breaking or valve tearing
- not proven as a long term treatment
- may be rejected
ignore information copied directly from the table without value added.

6
[11]

2

(a) (i) diffusion

1

(ii) carbon dioxide

accept CO₂ / CO₂

*do **not** accept CO²*

1

(iii) red blood cells

1

(b) 70

if no / incorrect answer then

70 000 000

or

280 x 0.25 gains 1 mark

ignore doubling the answer

2

(c) allows more gas / oxygen / CO₂
(exchange)

*do **not** accept air*

1

[6]

3

(a) any **three** from:

- parts of organisms have not decayed
accept in amber / resin
allow bones are preserved
- conditions needed for decay are absent
accept appropriate examples, eg acidic in bogs / lack of oxygen
- parts of the organism are replaced by other materials as they decay
accept mineralised
- or other preserved traces of organisms, eg footprints, burrows and rootlet traces
allow imprint or marking of organism

3

(b) (i) teeth for biting (prey)

must give structure + explanation

1

claws to grip (prey)

accept sensible uses

1

wing / tail for flight to find (prey)

1

(ii) any **two** from:

- new predators
- new diseases
- better competitors
- catastrophe eg volcanic eruption, meteor
- changes to environment over geological time
accept climate change
allow change in weather
- prey dies out **or** lack of food
allow hunted to extinction

2

[8]

4

(a) A - atrium

ignore references to right / left

1

B - ventricle

1

(b) (i) muscular

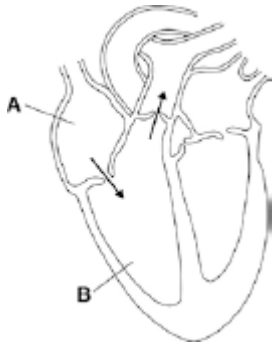
1

(ii) push blood

accept pump / force

1

(c)



arrows approx as indicated

1

arrow(s) showing flow from A to B
from B out / up / to artery

1

(d) (i) male

1

65 and over

1

(ii) fatty deposits / material in (coronary) arteries
allow correct points made about heart attacks

1

narrows / blocks / reduces flow

1

decreases oxygen supply (to heart muscle)

1

[11]

5

(a) (i) stomach

1

(ii) small intestine

1

(b)

	salivary glands	stomach	pancreas	small intestine
amylase	✓	✗	✓	✓
lipase	✗	✗	✓	✓
protease	✗	✓	✓	✓

1 mark per correct row

or

if no correct row max 1 mark for any one correct column

2

(c) enzyme / protease / pepsin most effective in acid conditions / low pH

accept optimum / correct pH

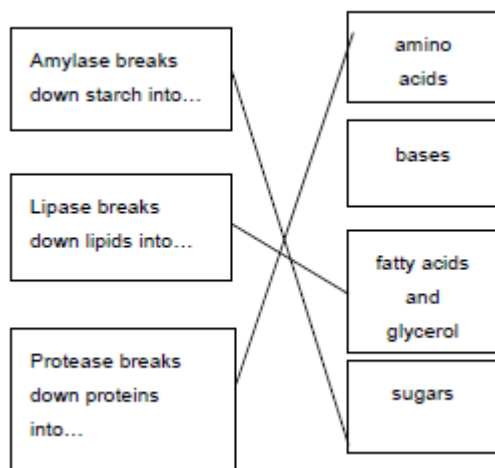
do not accept ref to incorrectly named enzymes

ignore killing bacteria

ignore acid breaks down food

1

(d) Enzyme Breakdown products



3

[8]

6

(a) guard cells

1

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

- species / plant
- length of time

ignore temperature and size of leaves

1

(ii) 20

correct answer = 2 marks

accept $\frac{1.6 - 1.28}{1.6} \times 100$

or $\frac{0.32}{1.6} \times 100$

for 1 mark

2

(c) less water loss / transpiration / evaporation

1

(d) hot

1

ignore bright / sunny conditions

dry / low humidity

1

wind(y)

1

[8]

7

(a) (i) xylem

1

(ii) water

1

minerals / ions / named example(s)

ignore nutrients

1

(b) (i) movement of (dissolved) sugar

*allow additional substances, eg amino acids / correct named sugar
(allow sucrose / glucose)*

*allow nutrients / substances / food molecules if sufficiently qualified
ignore food alone*

1

(ii) sugars are made in the leaves

1

so they need to be moved to other parts of the plant for respiration / growth / storage

1

(c) (i) mitochondria

1

(ii) for movement of minerals / ions

Do not accept 'water'

1

against their concentration gradient

1
[9]

8

(a) (i) A = (cell) membrane

1

B = cytoplasm

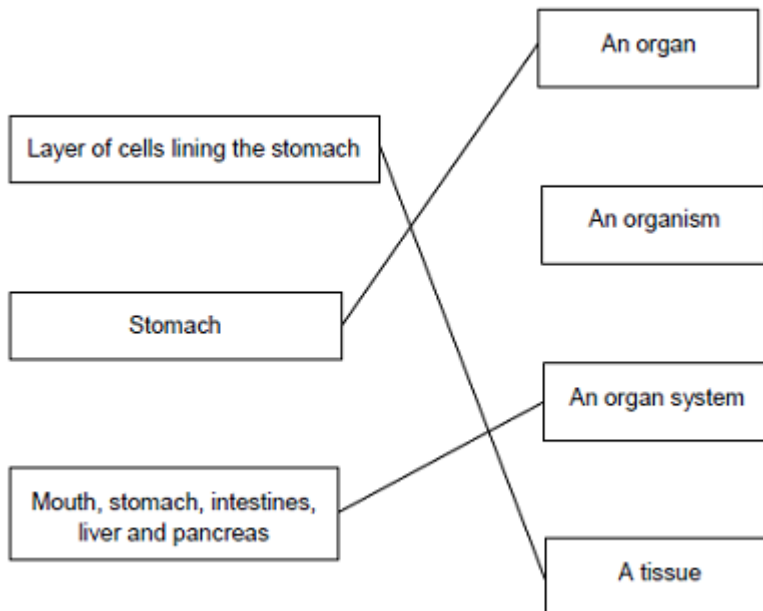
do not accept cytoplasm

1

(ii) To control the activities of the cell

1

(b)



extra lines cancel

3
[6]

9

(a) (i) amino acid(s)

accept peptide(s)

do not allow polypeptide(s)

1

(ii) protease

1

(b) (i) 2

1

(ii) repeat

do not allow other enzyme / substrate

1

using smaller pH intervals between pH1 and pH3

allow smaller intervals on both sides of / around pH2

allow smaller intervals on both sides of / around answer to (b)(i)

1

(iii) enzyme / pepsin denatured / shape changed

do not allow enzyme killed

allow enzyme 'destroyed'

1

enzyme / pepsin no longer fits (substrate)

allow enzyme / pepsin does not work

1

(c) hydrochloric (acid)

allow phonetic spelling

accept HCl

allow HCL

ignore hcl

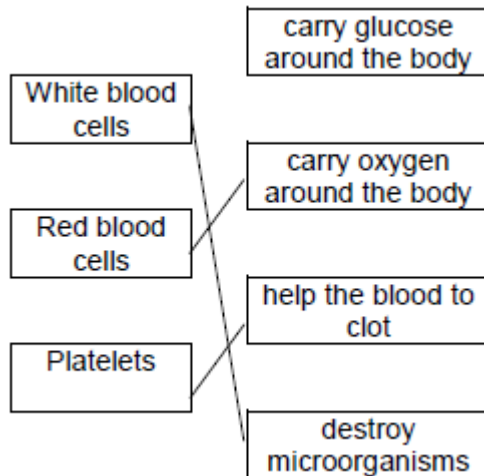
do not allow incorrect formula –e.g. H₂Cl / HCl₂

1

[8]

10

(a) (i)



one mark for each line

extra line negates a mark

3

(ii) any **one** from:

- carbon dioxide / CO₂
- urea

do not allow urine

ignore water

ignore ions

1

- (b) (i) B 1
- (ii) D 1
- (iii) vein 1
- accept correct named*
- examples*

- (c) (i) any **one** from: 1
- keeps artery / blood vessel open **or** widens artery / blood vessel
 - allows (more) blood to heart / cardiac muscle
 - (allows) blood to flow more easily
 - allows (more) oxygen to heart / cardiac muscle

- (ii) any **two** from: 2
- bleeding
 - allow blood clots*
 - infection
 - damaging blood vessels
 - damaging the heart
 - risk from anaesthetic

[10]