B2
ORGANISATION
TEST 1
Mark schemes

(a) biuret 1

(b) purple 1

(c) 1:1.6 1

(d) provides amino acids to make new muscle 1

(e) it has a large surface area 1

it has a thin surface 1

(f) C 1

lowest sugar (content) 1

[8]

2

(a) (A) right atrium 1

(B) right ventricle 1

(b) To take blood from the lungs to the heart 1

(c) keeps the (coronary) artery open / wide 1

so the blood can carry glucose and oxygen 1

to the heart (muscle) 1

for respiration 1

if marking points 2, 3 and 4 not awarded allow 1 mark for ‘keep a (constant) flow of blood to the heart (muscle)’

(d) bar D correctly plotted 1

bar E correctly plotted 1
(f) **Level 3 (5–6 marks):**
A detailed and coherent evaluation is provided that considers a range of relevant points about how well the data correlates with the statement, quoting relevant comparisons and comes to a conclusion consistent with the reasoning.

**Level 2 (3–4 marks):**
An attempt to relate relevant points within the data and come to a conclusion. The logic may be inconsistent at times but builds towards a coherent argument.

**Level 1 (1–2 marks):**
Discrete, relevant points made, attempting to apply understanding of the factors involved in development of CHD to the data in the table. The logic may be unclear and the conclusion, if present, may not be consistent with the reasoning.

**0 marks:**
No relevant content

**Indicative content**

data that supports statement:
- country A has the highest death rate at 285 deaths per 1000 and the lowest consumption at only 180 kg per person
- death rate in country E is less than half that in country A (125 compared with 285) and consumption is higher (244 compared with 180)
- other countries with lower death rates than A have higher consumption (eg country B 250 deaths per 1000 but consumption of 320 kg per person)

arguments against statement:
- but most of the data on the graph does not show clear correlation between death rates and consumption of data
- eg death rate in country B is second highest at 250 deaths per 1000 but consumption is highest at 320 kg per person, nearly double that in A where death rate is only 35 per 1000 more
- differences show no clear pattern – eg in countries where death rate is much lower the consumption is not a similar proportion higher (cf country D death rate just under half that in A but consumption not double that in A)
- there may be other factors affecting death rate that are not reported, such as smoking, obesity, exercise, stress

(a) (i) large intestine = E
small intestine = D
stomach = B
(b) The concentration in the blood is lower.

(a) breathing rate when walking is twice that at rest  
   *allow breathing rate when walking is 12 (breaths / minute) more than at rest*

   breathing rate when jogging is 5 times that at rest  
   *allow breathing rate when jogging is 48 (breaths / minute) more than at rest*

   breathing rate when jogging is 2.5 times that when walking  
   *allow breathing rate when jogging is 36 (breaths / minute) more than when walking*

   *allow for 1 mark if no other marks gained: breathing rate at rest is 12 (breaths per minute), breathing rate when walking is 24 (breaths per minute) and breathing rate when jogging is 60 (breaths per minute)  
   *or*
   breathing rate increases with increasing activity  
   *max 2 marks if written in terms of heart rate*
(b) (breathing rate increases)

to supply more oxygen / $O_2$

or
to supply oxygen / $O_2$ faster

allow to remove more carbon dioxide / $CO_2$

or
to remove carbon dioxide / $CO_2$ faster

do not accept incorrectly written formulae

for (aerobic) respiration

or
to reduce anaerobic respiration

or
to reduce lactic acid build up

(s0) that more energy is transferred / released

or

(because) more energy is required

do not accept used / produced / created or energy

made

reference to more / faster required at least once for full marks

(c) right ventricle / side of the heart pumps (blood) to the lungs

left ventricle / side of the heart pumps (blood) to the body

if no other marks scored allow 1 mark for one side pumps blood to the lungs and the other side pumps blood to the body

(d) any one from:

• (the left ventricle) has to pump blood further (than the right ventricle)

  allow (the left ventricle) has to pump blood all around the body

• (the left ventricle) has to pump blood with a greater force (than the right ventricle)

  allow (left ventricle) has to pump blood harder

• (the left ventricle) has to pump blood at a higher pressure (than the right ventricle)

  there must be a comparative statement
(e) any one from:
• strengthens heart (muscle)
• reduces chance of another heart attack
    
    ignore prevents / no heart attacks
• reduces / controls weight
• improves circulation
    
    allow decreases chance of fatty deposits
    
    or fat building up (in arteries / blood vessels)
    
    allow reduces resting heart rate

(a) 
(i) stomach

(ii) small intestine

(b) 

<table>
<thead>
<tr>
<th>salivary glands</th>
<th>stomach</th>
<th>pancreas</th>
<th>small intestine</th>
</tr>
</thead>
<tbody>
<tr>
<td>amylase</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>lipase</td>
<td>✗</td>
<td>✗</td>
<td>✓</td>
</tr>
<tr>
<td>protease</td>
<td>✗</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

1 mark per correct row

or

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

(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
(a) is not caused by a pathogen / infective organism
- allow not caused by a microorganism / microbe
- ignore not caused by infection
- ignore named pathogen unless bacteria, virus and fungus all mentioned

(so) is not passed / spread (from person to person)
- allow cannot be spread / caught
- allow is not infectious / contagious

(b) reduced / restricted / stopped blood flow
- it does not matter where blood flow is restricted to – heart / body

(so) less oxygen reaches heart (muscle / cells)
- must reference heart / it
- allow no oxygen reaches the heart (muscle / cells)

(so heart muscle / cells) cannot respire (enough)

or

(so heart muscle / cells) do not release (enough) energy
- do not accept do not make / produce / create energy
- ignore references to breathing / suffocation
- ignore blood clots / blockages

allow ‘it’ for heart
(c) **Level 3:** Relevant points (factors / effects) are identified, given in detail and logically linked to form a clear account.

**Level 2:** Relevant points (factors / effects) are identified and there are attempts at logical linking. The resulting account is not fully clear.

**Level 1:** Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.

**No relevant content**

**Indicative content**

**medical risk factors:**
- high blood pressure
- high cholesterol
- diabetes
- genetic factors
- medications

**lifestyle risk factors:**
- smoking
- obesity
- lack of exercise
- high fat / energy diet
- eating insufficient fruit / vegetables
- alcohol
- high salt intake
- exposure to air pollution
- certain drugs / correct named drug

**examples of links:**
- smoking – high bp / cholesterol / fatty deposition
- obesity – lack of exercise / high bp / cholesterol / fatty deposition / diabetes
- exercise – obesity / bp /diabetes
- diet – obesity / cholesterol / diabetes
- alcohol – bp / cholesterol
- high salt intake – high blood pressure
- genetic factors – bp / cholesterol / diabetes / obesity
- medication – can affect blood / blood vessels / metabolism

the main discriminator is the quality of linking
both lifestyle and medical factors are required for **level 3**
(a) any two from:

- to work out the correct dose to be given
- to check that the drug is working correctly
- to check for toxic effects.

(b) patients are randomly allocated to receive statin or a placebo

so neither patient nor doctor knows who has received which

answer in terms of only the drug company knows who is taking the statin or the placebo gains 2 marks

(c) To prevent false claims

(d) drug A reduced the blood cholesterol level more than drug B

drug A reduced the thickness of the artery or drug B increased the thickness of the artery

allow drug A made the artery thinner or drug B made the artery thicker

ignore side effects

(e) differences in number of patients reporting side effects are very similar

we don’t know what the patients died of

[9]

8

(a) xylem

(b) A is phloem, B is xylem

any three from:

- phloem transports sugars
- there are more sugars in fluid A
- xylem transports mineral ions / potassium ions / nitrate ions
- there are more mineral ions in fluid B.

(c) correct conversion of 1.18 µg to mg / cm³
(d) potassium ions are transported into the root
against a concentration gradient
by active transport

(a) plasma transports proteins / dissolved substances / food (molecules) / urea / hormones
or
blood cells are suspended in the plasma
platelets are involved in blood clotting

(b) the right side of the heart pumps blood to the lungs
and
the left side of the heart pumps blood around (the rest of) the body
(c) **Level 3 (5–6 marks):**
A detailed and coherent evaluation is provided which considers a range of relevant points and comes to a conclusion consistent with the reasoning.

**Level 2 (3–4 marks):**
An attempt to relate relevant points and come to a conclusion. The logic may be inconsistent at times but builds towards a coherent argument.

**Level 1 (1–2 marks):**
Discrete relevant points made. The logic may be unclear and the conclusion, if present, may not be consistent with the reasoning.

**0 marks:**
No relevant content

**Indicative content**

**pros of statins:**
- decreases blood cholesterol
- slows down build-up of fatty material in arteries
- (so) blood can flow to heart muscle cells

**cons of statins:**
- drug has to be taken regularly or may forget to take drug
- drug will need to be taken long-term
- side-effects of taking the drug
- effects of drug will take time to happen

**pros of stents:**
- blocked artery is held open
- (so) blood can flow to heart muscle cells
- will remain in place / work for a long time
- rapid recovery time

**cons of stents:**
- risk of infection from procedure
- risk of surgery eg heart attack
- risk of thrombosis or blood clot

a justified conclusion

(a) **(lack of) exercise**

*allow description of type or amount of exercise*
allow other risk factors not mentioned in table, eg high cholesterol levels, blood pressure, levels of obesity, diabetes

(b) the second highest death rate has the highest fruit and vegetable consumption

the lowest death rates don’t have high fruit and vegetable consumption

lowest death rates have a low percentage of the population that smokes.

(c) (it builds up) inside the coronary arteries

(causing) them to narrow

(this) reduces blood flow

so less oxygen gets to the heart muscle

(d) (statins) reduce cholesterol in the blood

so there is less build up of fatty material (in coronary arteries)

allow slows the rate of fat deposit

[10]