**B1 Rev Pack 4 Markscheme**

**M1.**          (a)     (i)      artery

**1**

(ii)     capillary

**1**

(b)     alveoli

**1**

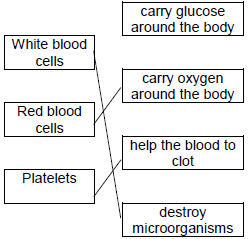
red blood cells

**1**

nucleus

**1**

**[5]**

**M2.**(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

*accept correct named*

*examples*

**1**

(c)     (i)      any **one** from:

•        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

**1**

(ii)     any **two** from:

•        bleeding

*allow blood clots*

•        infection

•        damaging blood vessels

•        damaging the heart

•        risk from anaesthetic

**2**

**[10]**

**M3.**(a)     55%

***2*** *marks for correct answer alone*

*accept 54 − 56*

*5.5 / 10 × 100 alone gains* ***1*** *mark*

**2**

(b)     any **three** from:

•        amino acids

•        antibodies

•        antitoxins

•        carbon dioxide

•        cholesterol

•        enzymes

•        fatty acid

•        glucose

•        glycerol

•        hormones / named hormones

•        ions / named ions

•        proteins

•        urea

•        vitamins

•        water.

*ignore blood cells and platelets*

*ignore oxygen*

*max 1 named example of each for ions and hormones*

*allow minerals*

**3**

(c)     Marks awarded for this answer will be determined by the Quality of Communication (QC) 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 pathogens with errors or roles confused.  
**or**the immune response with errors or roles confused.

**Level 2 (3 – 4 marks)**There is a description of pathogens **and** the immune response with some errors or confusion  
**or**a clear description of either pathogens **or** the immune response with few errors or little confusion.

**Level 3 (5 – 6 marks)**There is a good description of pathogens **and** the immune response with very few errors or omissions.

**Examples of biology points made in the response:**

•        bacteria and viruses are pathogens

*credit any ref to bacteria and viruses*

•        they reproduce rapidly inside the body

•        bacteria may produce poisons / toxins (that make us feel ill)

•        viruses live (and reproduce) inside cells (causing damage).

white blood cells help to defend against pathogens by:

•        ingesting pathogens / bacteria / (cells containing) viruses

*credit engulf / digest / phagocytosis*

•        to destroy (particular) pathogen / bacteria / viruses

•        producing antibodies

•        to destroy particular / specific pathogens

•        producing antitoxins

•        to counteract toxins (released by pathogens)

*credit memory cells / correct description*

•        this leads to immunity from that pathogen.

**6**

**[11]**

**M4.**(a)    A

*no mark - can be specified in reason part*

*if B given - no marks throughout*

*if unspecified + 2 good reasons = 1 mark*

high(er) pressure in A

*allow opposite for B*

*do* ***not*** *accept ‘zero pressure’ for B*

pulse / described in A

*accept fluctuates / ‘changes’*

*allow reference to beats / beating*

*ignore reference to artery pumping*

**2**

(b)     (i)      17

**1**

(ii)     68

*accept correct answer from student’s (b)(i) × 4*

**1**

(c)     oxygen / oxygenated blood

*allow adrenaline*

*ignore air*

glucose / sugar

*extra wrong answer cancels - eg sucrose / starch / glycogen / glucagon / water*

*allow fructose*

*ignore energy*

*ignore food*

**2**

**[6]**

**M5.**          (a)     hold cells together **or** prevent flow of cells **or** trap cells

**1**

(b)     12500

*if correct answer, ignore working / lack of working*

* for* ***1*** *mark*

*ignore any units*

**2**

(c)     (i)      size RBC approximately same size capillary **or**no room for more than one cell **or**only one can fit **or**RBC is too big

*allow use of numbers*

*do* ***not*** *accept capillaries are narrow*

**1**

(ii)     more oxygen released (to tissues) **or**more oxygen taken up (from lungs)

**1**

         and any **two** from:

•        slows flow **or** more time available

•        shorter distance (for exchange) **or** close to cells / capillary wall

•        more surface area exposed

**2**

**[7]**

**M6.**(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**

*± 0.5 small squares*

(e)     twice / two times (more likely)

**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

**6**

**[16]**

**M7.**(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]**

**M8.**         (a)     (i)     B **or** D

**1**

(ii)     A **or** B

**1**

(b)      any **four** from:

*more / faster must be implied at least once for full marks*

•        increased blood (flow)

*ignore reference to breathing*

•        (more) oxygen supplied **or** aerobic respiration

*allow less anaerobic (respiration)* ***or*** *and prevents oxygen debt*

•        (more) glucose / sugar / food supplied

*ignore feeding*

•        (higher rate of) respiration

•        (more) energy needed / released

*allow made*

•       (more) carbon dioxide removed

•        (muscles) doing (more) work **or** muscles contracting

•        remove heat / cooling

•        remove lactic acid **or** less lactic acid formed

**4**

**[6]**

**M9.**(a)     (lack of) exercise

*allow description of type or amount of exercise*

**1**

*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.

**3**

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

**1**

(causing) them to narrow

**1**

(this) reduces blood flow

**1**

so less oxygen gets to the heart muscle

**1**

(d)     (statins) reduce cholesterol in the blood

**1**

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

*allow slows the rate of fat deposit*

**1**

**[10]**

**M10.**(a)     (i)      xylem

**1**

(ii)     phloem

**1**

(iii)    transpiration

**1**

(iv)    stomata

**1**

(b)     (i)      any **one** from:

•        reduce / prevent evaporation of water from flask

•        holds plant shoot in place

•        prevent damage to the plant

**1**

(ii)     same surface area **or** number of leaves

*(because if they used larger / smaller size shoots) there would be a larger / smaller surface area* ***or*** *a larger/ smaller number of leaves*

*allow same number of stomata*

**1**

from which (the same amount of) water evaporates

*(and therefore) more / less water would escape*

*allow from which water escapes*

**1**

(iii)    4.5

*look for answer written in table*

**1**

(iv)    increasing temperature / heat increases (rate of) water loss / evaporation

**1**

(v)     having moving air / a fan increases (rate of) water loss / evaporation

**1**

(c)     (i)      0.3 g

**1**

(ii)     plastic bag reduces air flow across leaves  
**or**air is humid around the leaves

*allow plastic bag stops water (vapour) leaving  
allow air (in plastic bag) becomes saturated (with water)*

**1**

**[12]**

**M11.**          (a)     guard cells

**1**

(b)     (i)      2.00 / 2.0 / 2

**1**

(ii)     0.05 or 1/20

**1**

(iii)    (Q has)

*it = Q*

large(r) surface area / more stomata / thinner cuticle / larger leaves

*accept other sensible answers*

**1**

(iv)     wind     30

*extra box ticked cancels the mark*

**1**

(c)     wilting

*extra ring drawn cancels the mark*

**1**

**[6]**

**M12.**(a)     (i)      5.0

**1**

(5 × 0.8) **or** 4

*allow ecf from distance*

**1**

0.4

*allow ecf from 10-min volume*

**1**

(ii)     increased (rate of uptake)

**1**

more transpiration / evaporation

**1**

(b)     correct scales

*allow reversed axes*

**1**

correctly labelled axes with units

**1**

correct points

*one plot error = max* ***1*** *mark*

**2**

curved line of best fit

*allow correct straight line*

**1**

(c)     leaves wilt

**1**

because plants lose too much water (by evaporation)

**1**

through the stomata

**or**

because cells become plamolysed

**or**

stomata close

controlled by guard cells

to prevent wilting

**1**

**[13]**

**M13.**(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 *

*or          *

*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]**

**M14.**(a)     (i)      guard (cells)

*allow phonetic spelling*

**1**

(ii)     any **one** from:

*ignore reference to cells*

•        allow carbon dioxide to enter

*allow control loss / evaporation of water* ***or*** *control transpiration rate*

•        allow oxygen to leave.

*allow ‘gaseous exchange’*

**1**

(b)     (i)      200

*correct answer gains 2 marks with or without working*

*allow 1 mark for 0.1 × 0.1 = 0.01 (mm2)*

**2**

(ii)     more / a lot of / increased water loss

*allow plant more likely to wilt (in hot / dry conditions)*

**1**

(c)     (i)      0.12

**1**

(ii)     the lower surface has most stomata

**1**

stomata are now covered / blocked (by grease)

**1**

so water cannot escape / evaporate from the stomata

*ignore waterproof*

*to gain credit stomata must be mentioned at least once*

**1**

**[9]**

**M15.**(a)    solution in soil is more dilute (than in root cells)

*concentration of water higher in the soil (than in root cells)*

**1**

so water moves from the dilute to the more concentrated region

*so water moves down (its) concentration gradient* ***or*** *water moves from a high concentration of water to a lower concentration*

**1**

concentration of ions in soil less (than that in root cells)

**1**

so energy needed to move ions

**or**

ions are moved against concentration gradient

*the direction of the concentration gradient must be expressed clearly*

*accept correct reference to water potential or to concentrations of water*

**1**

(b)     any **three** from:

•        movement of water from roots / root hairs (up stem)

•        via xylem

•        to the leaves

•        (water) evaporates

•        via stomata

**3**

(c)    (i)      0.67/0.7

*accept 0.66, 0.6666666... or ⅔ or 0.6*

*correct answer gains* ***2*** *marks with or without working*

*if answer incorrect allow evidence of  for* ***1*** *mark*

*do* ***not*** *accept 0.6 or 0.70*

**2**

(ii)     during the first 30 minutes

any **one** from:

•        it was warmer

•        it was windier

•        it was less humid

•        there was more water (vapour) in the leaves

**1**

so there was more evaporation

*ignore ‘water loss’*

**or**

stomata open during first 30 minutes **or** closed after 30 minutes (1)

so faster (rate of) evaporation in first 30 min **or** reducing (rate of) evaporation after 30 min (1)

**1**

**[11]**