**B1 Rev Pack 9 markscheme**

**M1.**          (a)     (i)      oxygen

*do not credit air*

**1**

(ii)     lung(s)

*do not credit blood* ***or*** *nose or windpipe alone but accept as a neutral answer if included with lungs*

**1**

(b)     oxygen

**1**

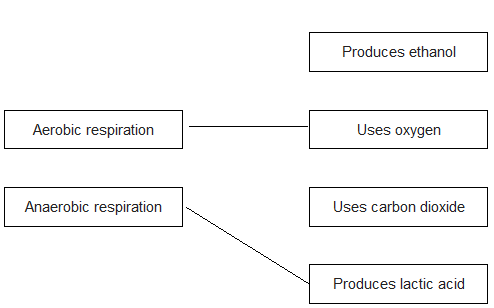
lactic acid

*both words required*

**1**

**[4]**

**M2.**(a)



*an extra line from a LH box negates that mark*

**2**

(b)     any **one** from:

•        not enough oxygen present (for aerobic respiration)

•        more energy required for exercise (than can be transferred by aerobic respiration)

**1**

*allow named example for exercise*

(c)     produces carbon dioxide

**1**

produces ethanol

**1**

plus any **two** from:

•        (carbon dioxide) makes bread rise

•        (carbon dioxide) makes beer / cider / (some) wines fizzy

*allow for alcoholic drinks / named drink*

•        (ethanol) is the alcohol in beer / cider / wine / spirits

**2**

**[7]**

**M3.**(a)     66 (beats per minute)

**1**

(b)     heart rate increased

**1**

(c)     4

**1**

(d)     any **two** from:

•        resting heart rate was lower

•        heart rate did not increase as much

•        heart rate did not increase as fast

•        heart rate returned to normal sooner

**2**

(e)     **Level 2 (3–4 marks):**

A detailed and coherent explanation is given, which logically links changes in the body during exercise to reasons for these changes.

**Level 1 (1–2 marks):**

Discrete relevant points made. Links may not be made.

**0 marks:**

No relevant content

**Indicative content**

**Changes:**

•        breathing rate increases

•        deeper breathing

•        (body) temperature increases

•        sweating occurs

•        muscle fatigue

•        vasodilation

**Explanations linked to correct change:**

•        to provide more oxygen

•        to remove carbon dioxide faster

•        (as) more energy required

•        (so) increased respiration

•        (so) more energy transferred

•        for movement or contraction of muscles

•        some energy warms the body

•        (sweating) cools the body down

•        (by) evaporation of sweat

**4**

**[9]**

**M4.**(a)     (to) stop them falling in the solution

**or**

to stop them drowning (in the solution)

**1**

(b)     **Level 2 (3–4 marks):**

A detailed and coherent explanation is given of how the droplet moves, clearly and  
logically linked to the process of respiration.

**Level 1 (1–2 marks):**

Simple statements are made about movement of the water droplet, but any attempts at explaining the reason or linking the movement to the process of respiration are unclear  
and poorly structured.

**0 marks:**

No relevant content

**Indicative content**

•        water droplet moves towards the maggots / boiling tube

Explanation:

•        the oxygen in the boiling tube is used up in respiration

•        (and) the carbon dioxide released from respiration is absorbed by solution **A**

•        which causes a pressure difference

•        so air is drawn into the tube

•        bringing the water droplet with it.

**4**

(c)     *x* axis: Temperature in °C

*both needed for the mark*

*y* axis: Rate of respiration in units

**1**

(d)     repeat the experiment at 30 °C

**1**

(e)     10.5

*allow range 10.4–10.8*

**1**

**[8]**

**M5.**          (a)     increased speed  
**or** harder exercise / running  
→increased need / use / loss of energy

**1**

*allow further you run / walk the more energy you need*

          increased mass / bigger → increased use of energy

**1**

(b)     any **three** from:

•        supply / using (more / enough) oxygen  
**or** get (more) oxygen in blood(\*)

•        remove (more) CO2(\*)

•        doing (more) work  
**or**using (more) energy allow produce energy(\*)

*(\*)need reference to ‘more’ ONCE only for full marks*

•        for respiration

•        prevent build up of lactic acid  
**or** prevent oxygen debt  
**or** prevent anaerobic (respiration)  
**or** allow aerobic (respiration)

**3**

**[5]**

**M6.**          (a)    person with muscle disease:

*allow reverse argument for healthy person*

any **three** from:

*NB all points are comparative except peak (point 3)*

*allow use of* ***two*** *approximate figures as a comparison*

•        higher resting rate **or** higher at start

•        when exercise starts / then increases more / more rapidly

*accept description eg rise …. fall*

•        peaks (then falls)

•        levels off later than healthy person

•        higher rate during exercise

*if no other marks awarded allow* ***1*** *mark for ‘it’s higher’*

•        greater range

**3**

(b)     (i)      oxygen

*accept adrenaline*

*accept O2*

*do* ***not*** *accept O, O2 or O2*

**1**

(ii)     cannot release sugar / glucose (from glycogen)

**or**

cannot store glucose / sugar (as glycogen)

**1**

need to receive glucose / sugar (from elsewhere)

*ignore oxygen*

**1**

for energy / respiration / cannot store energy

*ignore aerobic / anaerobic*

**1**

**[7]**

**M7.**(a)     anaerobic respiration

*allow phonetic spelling*

**1**

(b)     (i)      4.4

*4.2, 4.3, 4.5 or 4.6 with figures in tolerance (6.7 to 6.9 and 2.3 to 2.5) and correct working gains 2 marks*

*4.2, 4.3, 4.5 or 4.6 with no working shown or correct working with one reading out of tolerance gains 1 mark*

*correct readings from graph in the ranges of 6.7 to 6.9* ***and*** *2.3 to 2.5 but no answer / wrong answer gains 1 mark*

**2**

(ii)     more energy is needed / used / released

*do* ***not*** *allow energy production*

(at 14 km per hour)

*ignore work*

**1**

not enough oxygen (can be taken in / can be supplied to muscles)

*allow reference to oxygen debt*

*do* ***not*** *allow less / no oxygen*

**1**

so more anaerobic respiration (to supply the extra energy) **or** more glucose changed to lactic acid

*allow not enough aerobic respiration*

**1**

**[6]**

**M8.**          (a)     (i)      reduced sharply

*for 1 mark*

**1**

(ii)     converted to glucose which is respired to produce energy

*(allow answers in terms of glucagon)*

*gains 3 marks*

**3**

(b)     (i)      athlete A’s was most effective  
since resulted in highest muscle glycogen level on day of race  
for energy release during race

*for 1 mark each*

**3**

(ii)     e.g. excess carbohydrate stored as glycogen rather than fat in short term  
particularly if glycogen stores depleted

*for 1 mark each*

**2**

**[9]**

**M9.**(a)     5624

***allow 2 marks*** *for:*

*•        correct HR = 148* ***and*** *correct SV = 38 plus wrong answer / no answer*

***or***

*•        only one value correct* ***and*** *ecf for answer*

***allow 1 mark*** *for:*

*•        incorrect values* ***and*** *ecf for answer*

***or***

*•        only one value correct*

**3**

(b)     (i)      **Person 2** has low(er) stroke volume / SV / described

*eg* ***Person 2*** *pumps out smaller volume each beat*

*do* ***not*** *allow* ***Person 2*** *has lower heart rate*

**1**

(ii)     **Person 1** sends more blood (to muscles / body / lungs)

**1**

(which) supplies (more) oxygen

**1**

(and) supplies (more) glucose

**1**

(faster rate of) respiration **or** transfers (more) energy for use

*ignore aerobic / anaerobic*

*allow (more) energy release*

*allow aerobic respiration transfers / releases more energy (than anaerobic)*

*do* ***not*** *allow makes (more) energy*

**1**

removes (more) CO2 / lactic acid / heat

*allow less oxygen debt*

**or** less lactic acid made  
**or** (more) muscle contraction / less muscle fatigue

*if no other mark awarded,*

*allow person 1 is fitter (than person 2) for max 1 mark*

**1**

**[9]**