

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

- (a) 1.375 / 1.3746 / 1.38 / 1.4 (times greater);

1

- (b) 1. Potassium nitrate most effective **and** chicken manure least effective;
Accept greatest/highest growth/mass for most effective, and lowest growth/mass for least effective.
2. All fertilisers more effective than control;
3. No increase (in growth) with potassium nitrate above 30g;
4. Ammonium sulfate (shows) small/gradual increase after 30g;
5. Chicken manure effectiveness decreases after 45g

OR

Chicken manure effectiveness decreases at 60g;

6. Fertiliser/s provide nitrogen source for protein;
7. No statistical test (to determine if differences are significant);
Accept 'no SDs' (to determine if differences are significant).
Accept no (named) stats test, no error bars and no confidence limits.
8. Only shows (results for) spinach;
Accept only shows 'one species' or one type of plant.

5 max

- (c) 1. Weigh and heat;
Accept 'heat until sample remains the same mass' for 2 marks.
Ignore temperature.
2. (Until) mass is constant;
Accept weight for mass.

2

[8]

Q2.

- (a) 1. Increases dissociation of oxygen;
Accept unloading/ release/reduced affinity for dissociation
2. For aerobic respiration at the tissues/muscles/cells

OR

Anaerobic respiration delayed at the tissues/muscles/cells

OR

Less lactate at the tissues/muscles/cells;

2

- (b) 1. (Time) 10 minutes;
2. (Ratio) 1.6875(:1);

Allow 1 mark for correct ratio calculated from wrong time
For the ratio accept any correct rounding

2

- (c) 1. Increase in breathing (rate);
*Award mark points 1 and 2 **OR** 3 and 4*
Allow more breaths per minute
Reject more BPM

2. Similar/same $p\text{CO}_2$ per breath, but more breaths;

OR

3. Increase in tidal volume;
Accept each breath is deeper

4. Similar/same $p\text{CO}_2$ per breath, but increased volume per breath;

2

- (d) Second box ticked (Muscle fibres have a limited amount of phosphocreatine.)

1

- (e) 1. More acetylcoenzyme A would enter the Krebs cycle;
2. (So) the Krebs cycle generates (more) reduced coenzymes

OR

(So more) reduced coenzymes pass their electrons to the electron transfer chain;
Accept examples of reduced coenzymes
Reject production of reduced NADP or NADPH_2

3. (So more) ATP would be produced;
idea for more is required once

4. Athletes could build (slow) muscle (fibres) without exercising;
Ignore 'develop (slow) muscle (fibres) at rest' as in stem of question
Accept description of not exercising, eg without training

5. (Having more) slow muscle (fibres) would increase endurance;
Accept descriptions of endurance in terms of delayed onset of anaerobic respiration

4 max

- (f) 1. (EPO) causes blood to thicken;
Accept descriptions of thickening, eg more viscous
2. (The thickened blood) could block the coronary arteries

OR

(The thickened blood) slows blood flow

OR

(The thicker blood) could cause clots;
Reject atheroma/plaque (forms)
Accept could cause thrombus/embolus

2

- (g) 1. Some cyclists will gain a bigger advantage/increase

OR

Cyclists with a haematocrit of 50% would not be able to gain an advantage;
Accept use of the data, or suitable calculations, eg some may have an 8% increase, others 0%
Some cyclists might naturally have a haematocrit over 50% (and so not be allowed to compete)

2. There are health risks (associated with) taking EPO;
Accept dangerous side-effects of taking EPO, or examples of health risks

2

[15]