Name of the Student:_____
Max. Marks : 25 Marks **Time : 25 Minutes**

Mark Schemes

Q1.

(a) 1. (Colonisation by) pioneer species;

2. Pioneers/species/organisms change the environment/habitat/conditions/factors;
Accept example of change e.g. forms soil/humus/organic matter/nutrients.
Must convey idea of change being caused by pioneers/species/organisms

3. (Environment becomes) less hostile for other/new species
OR
(Environment becomes) more suitable for other/new species
OR
(Environment becomes) less suitable for previous species;
Accept previous species out-competed.

4. Change/increase in diversity/biodiversity;
Ignore increase in genetic diversity.

5. (To) climax community;

4 max

(b) 0.155;
Accept standard form e.g. 15.5 x 10^{-2}

1

(c) 1. Answer of 180/178/177.5 = **2 marks**;;
Ignore any numbers following 177.5

2. Incorrect answer but shows use of numbers 57 **and** 127 (with decimal points in any position) within the calculation = **1 mark**;

2

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Q2.

(a) Substitution;

Accept inversion or translocation

Ignore 'point mutation'

1

(b)

Max 2 marks for mark points 2, 3 and 4

1. ($VO_{2\,max}$ **and** CS activity) increased for both groups;

2. No statistical test, **so** do not know if **differences** are significant
OR
No statistical test, **so differences** could be due to chance;

Ignore standard deviation

Accept correct named statistical test eg t-test

3. Only 8 weeks training
OR
Training did not last long;

4. Might not be true for all types of training/exercise/females;

3 max

(c) In Group **C**:

1. Less mitochondrial replication/production;

*1. and 2. Accept converse for Group **T***

2. Less transcription (of genes) for mitochondrial proteins/CS
OR
Less translation of (mRNA into) mitochondrial proteins;

Accept less CS/enzyme is produced

2

(d)

Max 2 marks for mark points 3, 4 and 5

Ignore any answers relating to sample size or duration of investigation

Ignore 'correlation does not mean causation' unless qualified

For (no mark)

1. (From **Figure 2** Group **T** have) increased CS activity for Krebs cycle;

2. (from **Figure 1** Group **T** have) increased $VO_{2\,max}$ **so** more oxygen (available)
OR
(from **Figure 1** Group **T** have) increased $VO_{2\,max}$ **so** more aerobic respiration
OR
(from **Figure 1** Group **T** have) increased $VO_{2\,max}$ **so** delayed anaerobic respiration;

Accept 'less lactate' for delayed anaerobic respiration

Against (no mark)

3. No correlation between (percentage change in) $VO_{2\,max}$ and CS activity
OR
No correlation on **Figure 3**;

4. It might not be thymine causing the increase

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OR

There may be other differences in the control region (of Group **T**) that cause the increase;

Ignore 'could be due to lifestyle/diet changes'

5. $VO_{2\ max}$/CS activity not the only measures of ability to exercise for longer;

Accept ideas that they did not measure ability to exercise for longer

3 max

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Q3.

(a) 1. (Less/no) ATP;

2. (Less/no) reduced NADP;

Accept NADPH, NADPH + H, $NADPH_2$ NADPH + H^+

Reject reduced NAD, NADH etc,

2

(b) 1. (Less/no) carbon dioxide (reacts) with RuBP;

2. (Less/no) GP;

2

(c) 1. Stroma (of/in chloroplast);

Reject: stoma

Reject stroma of cytoplasm/chlorophyll

Reject stroma of mitochondrion

Ignore references to Calvin cycle or the light-independent reaction

1

(d) 1. Rubisco activity increases with temperature
OR
Rubisco optimum temperature is above (**rubisco activase**);

2. (Rubisco) **activase** activity decreases at high temperatures (allow any temperature above 25 ºC.)
OR
(Rubisco) **activase** optimum (allow in range) 25 to 30 ºC.;

Accept denatures at high temperature (allow any temperature above 25 ºC)

3. (Results/graphs suggest) **activase** cannot/does not affect activity of rubisco;

4. (Results are) only for cotton;

Accept may not be the same in other species/types of plant

Ignore: only one study

5. (Results are) for isolated enzymes;

6. No stats test;

4 max

[9]

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