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

Mark Schemes

Q1.

(a) 1. *E. rufus* in north (west)
OR
E. rufus in the west
OR
E. rufus above river;

2. *E. rufifrons* in south
OR
E. rufifrons in west **and** east
OR
E. rufifrons below river;

1 and 2. Accept equivalent valid statements e.g., for 1, no E. rufus in south.

*1 and 2. If neither mark is awarded, accept, for one mark, 'they are separated by the river' **OR** 'there is no overlap in their distribution/ranges'.*

1 and 2. Accept converse.

1 and 2. Do not penalise 'prefer'.

3. (Actual) distribution similar to expected (distribution)
OR
(Actual) distribution similar to environmental needs
OR
(Actual) distribution (slightly) less than expected distribution;

Accept for one or both species.

3

(b) 1. Geographical isolation;
OR
Allopatric speciation;

Ignore descriptions of geographical isolation.

Reject sympatric.

Ignore reference to two species at start.

2. Reproductive separation/isolation
OR
No gene flow
OR
Gene pools separate;

Reproductive isolation must be at beginning of process.

Accept no interbreeding but must be a separate idea from mp 6 which relates to definition of a species.

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Reject no inbreeding.

3. Different selection pressures;
   OR
   Different environmental/abiotic conditions/factors;

4. (Variation due to) mutation(s) (in different populations);

5. (Different/advantageous) allele/s passed on/selected
   OR
   Change in frequency of allele/s;

6. (Eventually different species) cannot (inter)breed to produce fertile offspring;

5 max

(c) (Marking) does not affect survival/predation/recapture;

Accept. Mark does not rub/wash off/is non-toxic.

Ignore 'does not harm' on its own unless it relates to survival/predation/recapture.

1

(d) 3;

Ignore any wording provided e.g. lemurs.

1

[10]

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Q2.

(a) Correct answer of 6.0×10^8/6.02×10^8/6.0192×10^8 = **3 marks**;;;

601920000 = **2 marks**;;

8.8 × any **two** of 12000 **OR** 95 **OR** 60 = **1 mark**

1.0032×10^7 / 6.336×10^6 / 5.0160×10^4 = **1 mark**

*Correct answer but not in correct standard form = **2 marks**, eg 60.192 × 10^7*

Accept 10032000 / 6336000 / 50160 for 1 mark

3

(b) 1. (This difference) is **not** significant;

2. There is greater than a 0.5 probability that this difference is due to chance
OR
There is greater than a 0.05 probability that this difference is due to chance

Accept 50%/1 in 2 for 0.5

Accept 5%/1 in 20 for 0.05

Reject 'results' for 'difference' once

2

(c) 1. Less ATP **and** reduced NADP produced;

Accept NADPH/$NADPH_2$ for reduced NADP

Reject less reduced NAD/NADH for reduced NADP

2. Less GP/glycerate 3-phosphate reduced/converted to triose phosphate;

*If triose phosphate is not mentioned, **reject TP once***

3. Less triose phosphate to regenerate/make RuBP
OR
Less RuBP is regenerated/made;

*If triose phosphate is not mentioned, **reject TP once***

4. Less RuBP to react with carbon dioxide

Need idea of less at least once

*Reject **no** once*

*If mark points 2, 3 and 4 are not present, allow 1 mark for less light independent reactions **OR** fewer Calvin cycles.*

4

(d) 1. 3.5875×10^{-3};

Accept any correct rounding eg 4×10^{-3}

2. kg m^{-2} h^{-1};

*Accept per m^2 **and/or** per hour*

Accept kg/m^2/h

Accept kg h^{-1} m^{-2}

Reject kg^{-1}

*Reject m^{-2} h^{-1} kg **OR** h^{-1} m^{-2} kg*

2

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(e) 1. (In the shade, so) **less/slower rate of** photosynthesis;

Accept any named aspect of photosynthesis that uses light, eg LDR, photoionisation

2. (Slow-growing, so) would take a long time to replace (mature leaves)
OR
Leaves more likely to reach maturity
OR
Leaves take a long time to mature;

Accept would take a long time to make cellulose or any other correct named compound

3. Plants can maintain (a large enough) surface area for photosynthesis
OR
Plants can absorb enough light;

2 max

(f) Yes (no mark)

1. The most recently evolved species/asterids produce more than the mean concentration;

2. The least recently evolved species/ferns produce less than the mean concentration;

No (no mark)

3. The highest concentration was **not** in the most recently evolved species/asterids
OR
The highest concentration was in magnoliids
OR
Magnoliids produce more than more recently evolved species/basal angiosperms/rosids/ asterids;

4. The lowest concentration was **not** in the least recently evolved species/ferns
OR
The lowest concentration was in monocots
OR
Monocots evolved more recently but produce a lower concentration than ferns;

5. The least recently evolved species/ferns have the same concentration as more recently evolved species/basal angiosperms/rosids;

6. Basal angiosperms and rosids have the same concentration but evolved at different times;

Ignore answers relating to no statistical testing

Accept 'newest species' for most recently evolved species/asterids

Accept 'oldest species' for least recently evolved species/ferns

2 max

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