Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) 1. Organic

2. Respiration
Ignore aerobic/anaerobic

3. Carbon
Accept cells/tissue(s)/plant(s)/animal(s)/organism(s)/ NPP/ living material/biological molecules.
Ignore biomass/biological materials/organic matter and reference to 'dry'.

4. Calorimetry;;
Accept calorimeter but reject colorimeter.
Accept phonetic spellings.

*4 correct = **2 marks***
*2–3 correct = **1 mark***
*0–1correct = **0 marks***

2

(b) 1. Carbon dioxide combines/reacts with ribulose bisphosphate/RuBP;
Accept idea of fixation for 'reacts'.

2. Produces two glycerate (3-)phosphate/GP using (enzyme) Rubisco;
Accept: any answer which indicates that 2 × as much GP produced from one RuBP catalysed by Rubisco.
Reject GP once if incorrectly named e.g., glucose 3- phosphate.

3. GP reduced to triose phosphate;
Reject GP once if incorrectly named e.g., glucose 3- phosphate.
Must have idea of reduction. This may be conveyed by stating mp4.
Only accept TP if triose phosphate is also in the answer. However only penalise once.

4. Using reduced NADP;
Accept NADPH or $NADPH_2$ or NADPH + H for reduced NADP.
Reject: Any reference to reduced NAD for mp4 but allow reference to reduction for mp3.
Must be in context of GP to triose phosphate.

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5. Using <u>energy</u> from ATP;

Must be in context of GP to triose phosphate.

6. Triose phosphate converted to glucose/hexose/RuBP/ribulose bisphosphate/named organic substance;

Only accept TP if triose phosphate is also in the answer. However only penalise once.

Accept marks in suitable diagram.

6

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Q2.

(a) Automarked question − ☑ Reduction of pyruvate (Box 3)

1

(b) 1. Oxygen/O_2 taken up/used (by seeds);

2. Carbon dioxide/CO_2 (given out) is absorbed by solution/potassium hydroxide/KOH;

3. Decrease in pressure/volume (of air inside);

Ignore 'negative pressure' but reject reference to vacuum.

Accept 'air pressure higher than inside'.

3

(c) 1. Distance (drop/liquid moves);

Accept description of distance, e.g. 'start and end position'.

2. Diameter/radius/bore of tubing/lumen

Accept (cross-sectional) area of tubing/lumen.

Ignore time.

2

(d) 1. Remove potassium hydroxide/KOH
OR
Remove solution which removes carbon dioxide.
OR
Replace potassium hydroxide/KOH with water;

Reject if seeds removed or another organism used.

2. Record distance liquid moves (without potassium hydroxide);

Reject moves to the right.

Accept 'liquid would not move'.

3. Use difference in distance liquid moves (with potassium hydroxide and without potassium hydroxide)

OR

Use difference in (calculated) volumes (with potassium hydroxide and without potassium hydroxide);

Accept 'if liquid does not move (volume of) carbon dioxide produced is the same as (volume of) oxygen used'.

*Answers which add/use a syringe, reject mp2 **and** mp3.*

3

(e) Answer in the range 3×10^{-7} to 3.33×10^{-7};

Accept equivalent answers in this range which are not in standard form.

Accept 3.0×10^{-7}

Ignore any numbers after 3.33.

1

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