Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

(a) Describe how NADP is reduced in the light-dependent reaction of photosynthesis.

_____

_____

_____

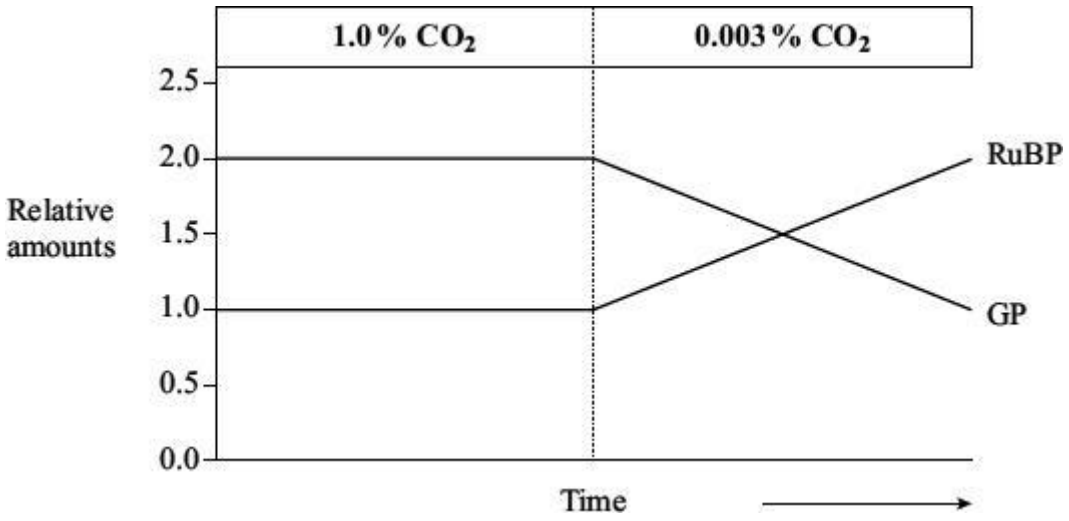
_____

(2)

(b) In an investigation of the light-independent reaction, the amounts of glycerate 3-phosphate (GP) and ribulose bisphosphate (RuBP) in photosynthesising cells were measured under different environmental conditions.

Figure 1 shows the effect of reducing the carbon dioxide concentration on the amounts of glycerate 3-phosphate and ribulose bisphosphate in photosynthesising cells.

Figure 1



(i) Explain why there is twice the amount of glycerate 3-phosphate as ribulose bisphosphate when the carbon dioxide concentration is high.

_____

_____

(1)

(ii) Explain the rise in the amount of ribulose bisphosphate after the carbon dioxide

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concentration is reduced.

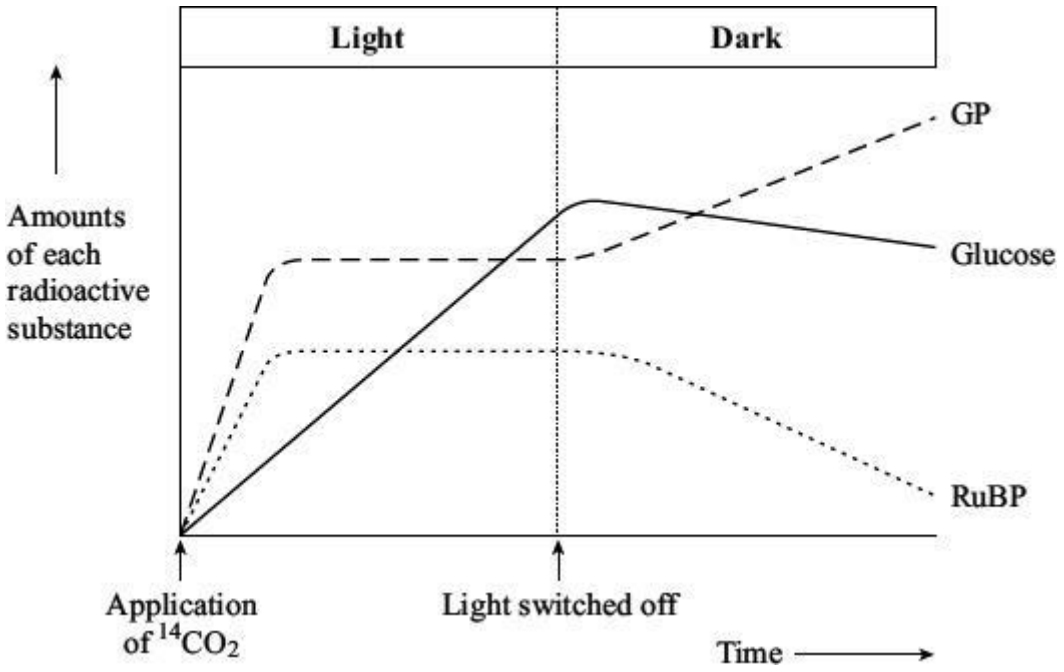
_____

_____

(1)

(c) **Figure 2** shows the results of an experiment in which photosynthesising cells were kept in the light and then in darkness.

Figure 2



(i) In the experiment the cells were supplied with radioactively labelled $^{14}CO_2$. Explain why the carbon dioxide used was radioactively labelled.

_____

_____

(1)

(ii) Explain how lack of light caused the amount of radioactively labelled glycerate 3-phosphate to rise.

_____

_____

_____

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(2)

(iii) Explain what caused the amount of radioactively labelled glucose to decrease after the light was switched off.

_____

_____

(1)

(Total 8 marks)

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Q2.

(a) Name the **two** substances produced by anaerobic respiration in humans.

1. _____

2. _____

(2)

(b) When an athlete runs in a 100 metre race, 90% of the energy needed is provided by anaerobic respiration.

(i) Explain why most of the energy is provided by anaerobic respiration rather than aerobic respiration.

_____

_____

_____

_____

(2)

(ii) The athlete continues to breathe deeply for several minutes after the race ends. Explain why this is necessary.

_____

_____

_____

_____

(2)

(Total 6 marks)

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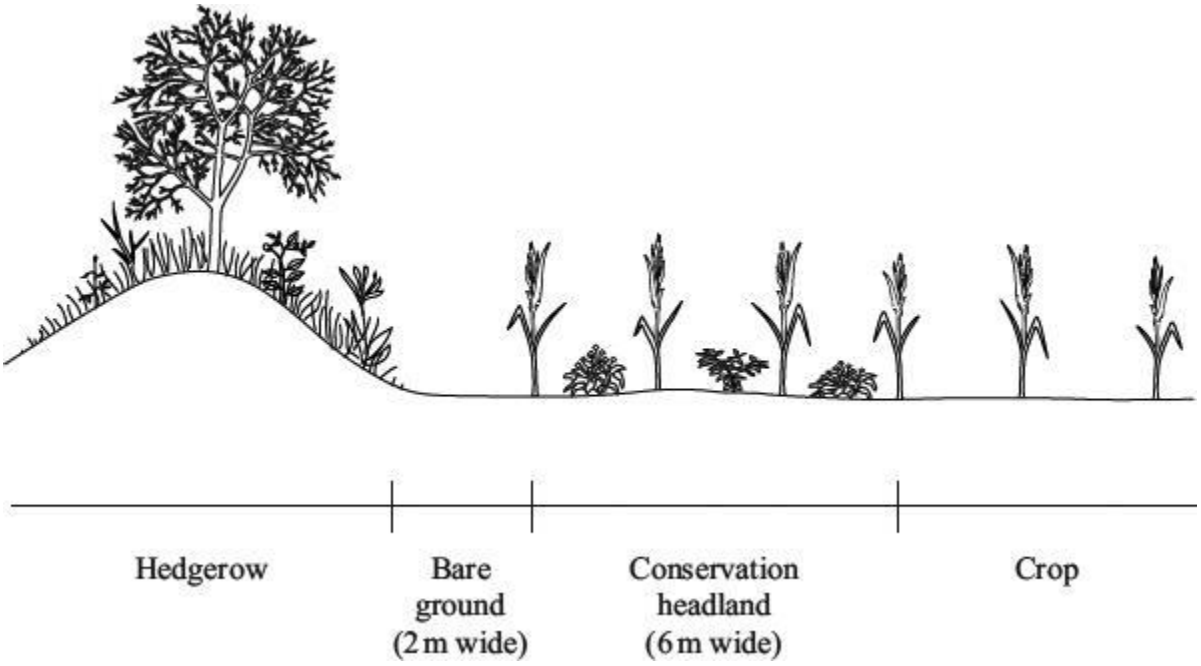
Q3.

The diagram shows a hedgerow and part of a field with a crop. The land is farmed in a way that conserves wildlife. The strip of bare ground next to the hedgerow is ploughed frequently to prevent any plants from growing. The first 6 m of the field, called the conservation headland, is sprayed with a selective herbicide to control some kinds of weeds. The rest of the field is sprayed with herbicide to kill all weeds.



(a) Suggest **one** advantage of leaving a strip of bare ground between the hedgerow and the field.

_____

_____

(1)

(b) Suggest the benefit of allowing some weeds to grow in the conservation headland.

_____

_____

_____

_____

(2)

(c) After harvesting the crop, the farmer digs the unwanted stems and roots into the soil. Explain how the nutrients contained in these plant parts become available for use by other organisms.

_____

_____

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_____

_____

(4)
(Total 7 marks)

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