Practice Question Set For A-Level
**Subject : Biology**
**Paper-2 Topic:5 Energy Transfer In And Between Organisms**

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

Q1.

When one mole of glucose is burned, 2800 kJ of energy are released. However, when one mole of glucose is respired aerobically, only 40% of the energy released is incorporated into ATP. Each mole of glucose respired aerobically produces 38 moles of ATP.

(a) (i) Calculate how much energy is incorporated into each mole of ATP. Show your working.

Answer _____ kJ

**(2)**

(ii) When glucose is respired what happens to the energy which is **not** incorporated into ATP?

_____

**(1)**

(b) (i) When one mole of glucose is respired anaerobically, only 2 moles of ATP are produced. Explain why less energy is released in anaerobic respiration.

_____

_____

**(1)**

(ii) At the end of a sprint race, a runner continues to breathe rapidly for some time. Explain the advantage of this.

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**(2)**
**(Total 6 marks)**

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Q2.

(a) Mitochondria in muscle cells have more cristae than mitochondria in skin cells. Explain the advantage of mitochondria in muscle cells having more cristae.

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**(2)**

(b) Substance **X** enters the mitochondrion from the cytoplasm. Each molecule of substance **X** has three carbon atoms.

(i) Name substance **X**.

_____

**(1)**

(ii) In the link reaction substance **X** is converted to a substance with molecules effectively containing only two carbon atoms. Describe what happens in this process.

_____

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_____

**(2)**

(c) The Krebs cycle, which takes place in the matrix, releases hydrogen ions. These hydrogen ions provide a source of energy for the synthesis of ATP, using coenzymes and carrier proteins in the inner membrane of the mitochondrion.

Describe the roles of the coenzymes and carrier proteins in the synthesis of ATP.

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**(3)**

**(Total 8 marks)**

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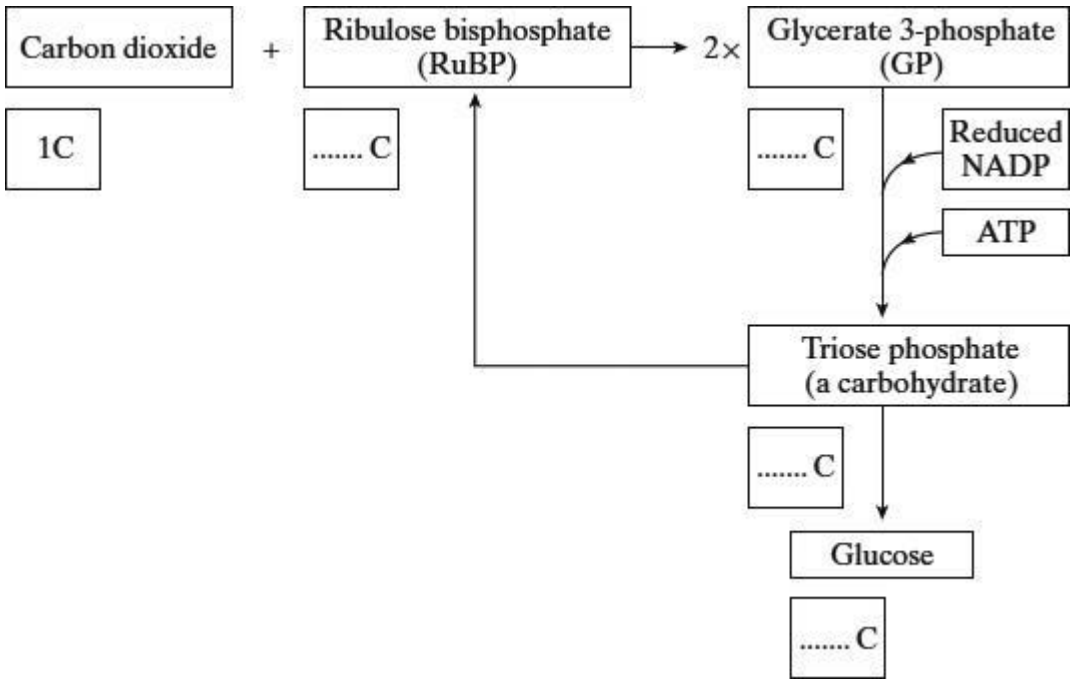
Q3.

The diagram shows a summary of the light-independent reaction of photosynthesis.




(a) (i) Complete the boxes to show the number of carbon atoms in the molecules.

**(2)**

(ii) In which part of a chloroplast does the light-independent reaction occur?

_____

**(1)**

(iii) Which process is the source of the ATP used in the conversion of glycerate 3-phosphate (GP) to triose phosphate?

_____

**(1)**

(iv) What proportion of triose phosphate molecules is converted to ribulose bisphosphate (RuBP)?

_____

**(1)**

(b) Lowering the temperature has very little effect on the light-dependent reaction, but it slows down the light-independent reaction. Explain why the light-independent reaction slows down at low temperatures.

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**(2)**

**(Total 7 marks)**

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