Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Level

BIOLOGY **9700/04**

Paper 4 Structured Questions A2 Core

May/June 2005

1 hour 15 minutes

Candidates answer on the Question Paper.
Additional Materials: Answer Paper should be available on request.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name in the spaces provided at the top of this page.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** questions in Section A and **one** question from Section B.
Circle the number of the Section B question you have answered in the grid below.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
Section A	
6 or 7	
Total	

This document consists of **8** printed pages, **3** lined pages and **1** blank page.

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Section A

Answer **all** questions.

Write your answers in the spaces provided.

1 Fig. 1.1 shows the molecular structure of ATP.

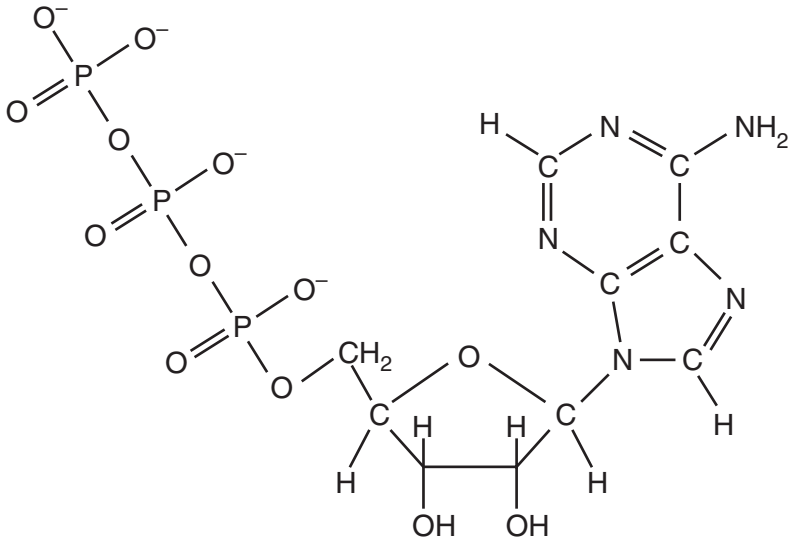


Fig. 1.1

(a) Describe the main structural features of the molecule.

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.....

.....[3]

(b) Explain how ATP is able to transfer energy in cells.

.....

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.....[3]

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(c) State how ATP is synthesized in mitochondria.

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.....[4]

[Total: 10]

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2 Fig. 2.1 is a diagram of pair of homologous chromosomes during meiosis.

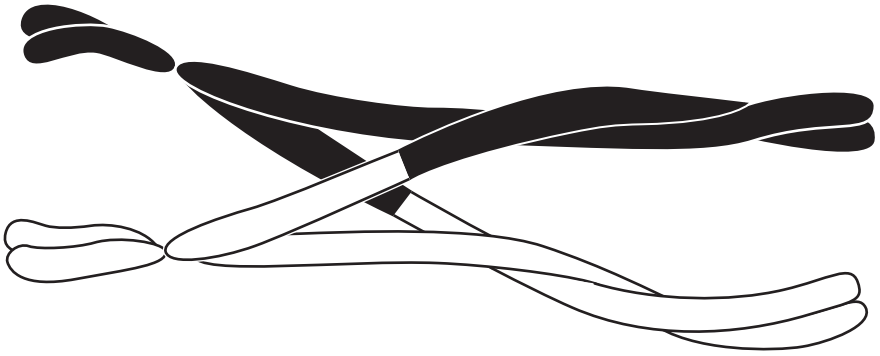


Fig. 2.1

(a) State what stage of meiosis is shown.

.....[1]

(b) Describe what has occurred between the two homologous chromosomes.

.....

.....

.....

.....

.....[3]

(c) Explain how this can lead to variation.

.....

.....

.....[2]

(d) Describe **two** other sources of variation that are possible as a result of meiosis.

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.....[4]

[Total: 10]

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3 Fig. 3.1 is a diagram of a reflex arc.

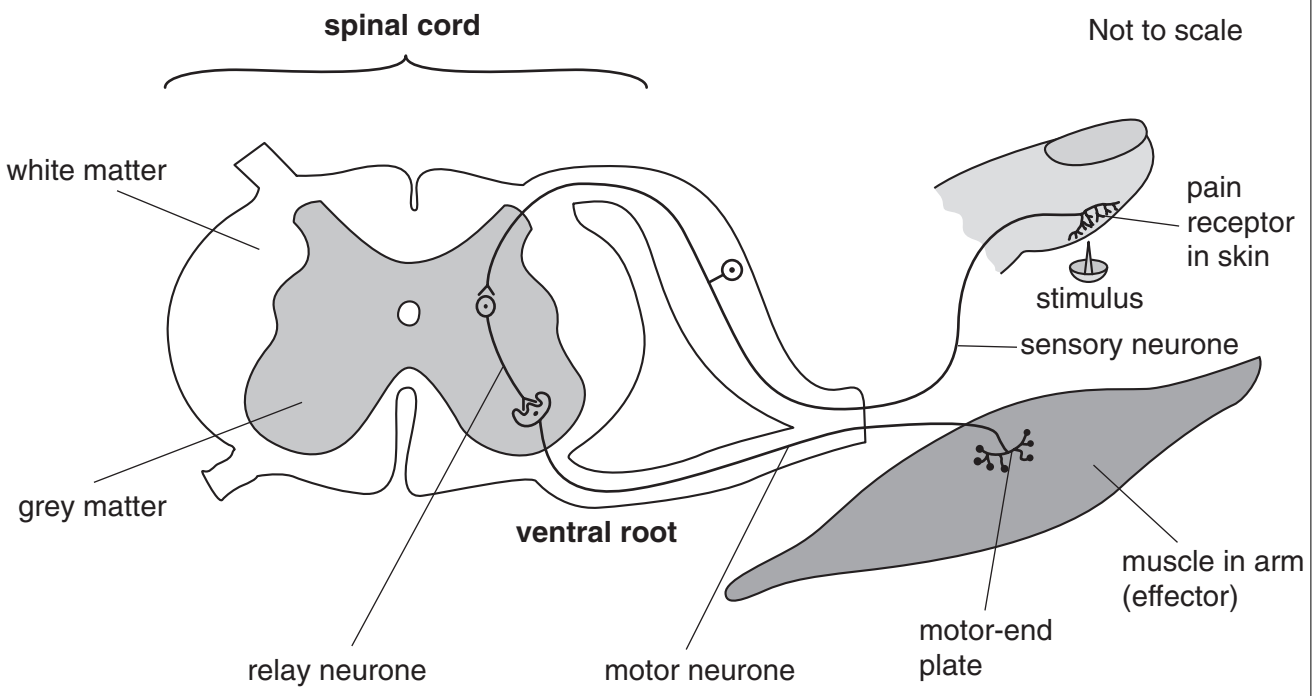


Fig. 3.1

(a) Explain **briefly** how the stimulus at the finger produces an impulse in the sensory neurone.

.....

.....

.....

.....[3]

(b) Describe the role of the motor neurone in the reflex arc.

.....

.....

.....

.....[3]

(c) Suggest why nerve impulses can only travel in one direction through the reflex arc.

.....

.....

.....[2]

[Total: 8]

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4 Fig. 4.1 is a diagram of a section through the undersurface of a dicotyledonous. leaf.

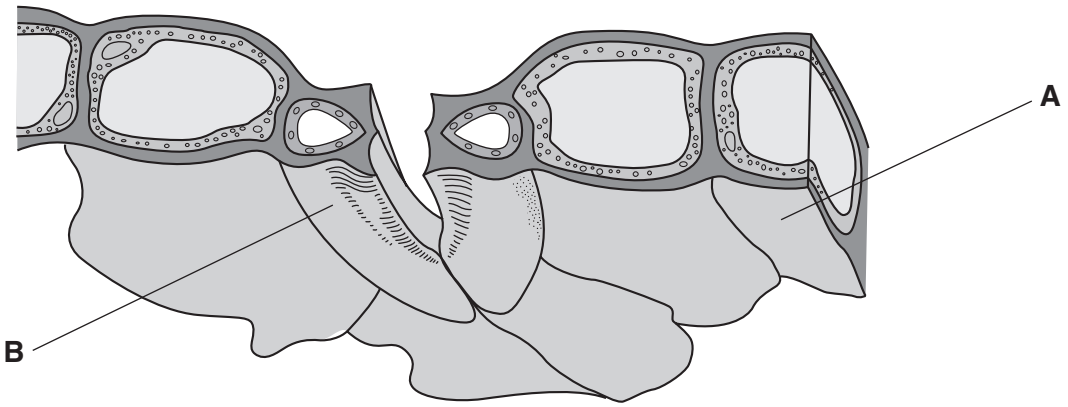


Fig. 4.1

(a) Name the cells **A** and **B**.

A .....

B .....[2]

(b) Explain the role of the pore shown, in relation to photosynthesis in the leaf.

.....

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.....[4]

(c) With reference to Fig. 4.1, list two visible features of the cell **B** that allows the pore to open and close.

feature 1 .....

.....

feature 2 .....

.....[2]

[Total: 8]

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5 Fig. 5.1 shows the main stages of the Calvin cycle.

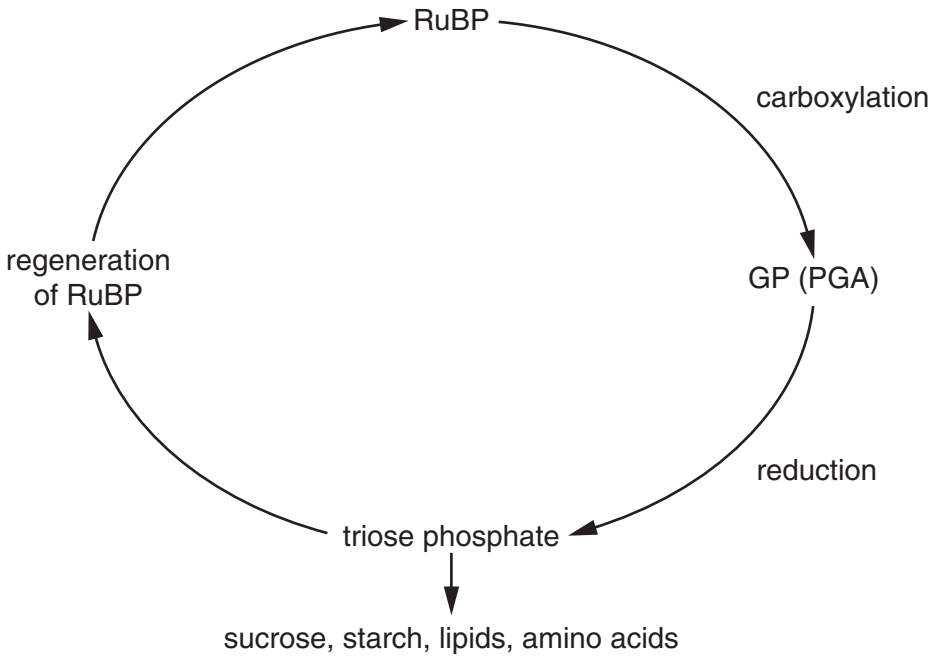


Fig. 5.1

(a) State precisely where the Calvin cycle occurs in plant cells.

.....[1]

(b) Describe how carbon dioxide is fixed in the Calvin cycle.

.....

.....

.....[2]

(c) Explain how the products of photophosphorylation are used in the Calvin cycle.

.....

.....

.....

.....[3]

(d) Explain what initially happens to the concentration of RuBP and GP if the supply of carbon dioxide is reduced.

RuBP .....

.....

GP .....

.....[3]

[Total: 9]

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[Turn over

Section B

Answer only **one** question from this section.

In this section, answers should be illustrated by large, clearly labelled diagrams wherever possible.

Your answer to Section **B** must be in continuous prose, where appropriate.

Your answer must be set out in sections **(a)** and **(b)**, as indicated in the question.

6 **(a)** Describe the role of auxins in apical dominance. [6]

(b) Explain the role of gibberellins in the germination of wheat or barley. [9]

[Total: 15]

7 **(a)** Describe why variation is important in natural selection. [6]

(b) Explain the role of isolating mechanisms in the evolution of new species. [9]

[Total: 15]

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