Centre Number	Candidate Number	Name

CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE **5125/04, 5126/04**

Paper 4 Biology

October/November 2003

1 hour 15 minutes

Additional Materials: Answer Paper

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Section A
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

Section B
Answer any **two** questions.
Write your answers on the separate answer paper provided.

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.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

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Section A	
Section B	
Total	

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Section A

Answer **all** the questions in the spaces provided.

1 The table in Fig. 1.1 shows the functions of parts of the male reproductive system.

Use words from the list to complete the table.

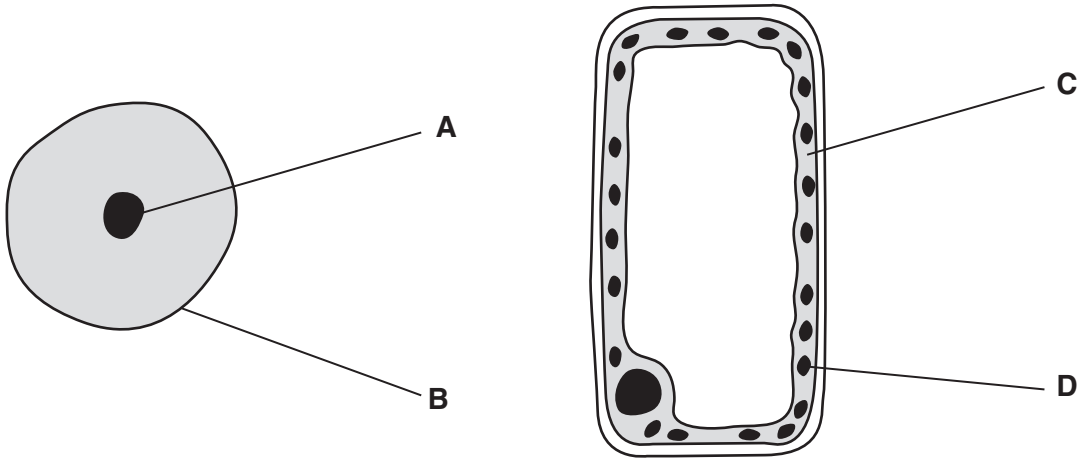
prostate gland **scrotum** **sperm duct** **testis** **urethra**

part	main function in reproduction
	produces sperms
	produces nutrient fluid for sperms
	transports sperms through the penis to the vagina
	protects the testes from overheating

[4]

Fig. 1.1

2 The diagrams in Fig. 2.1 show an animal cell and a plant cell.



animal cell plant cell

Fig. 2.1

(a) Name the parts labelled **A**, **B**, **C** and **D**.

A .....

B .....

C .....

D .....[4]

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(b) Name the part of a cell

(i) where photosynthesis takes place,

.....[1]

(ii) that controls passage of substances in and out of the cell.

.....[1]

(c) Name two parts found in plant cells but **not** in animal cells.

1. .....

2. .....[2]

3 Phenylketonuria (PKU) is an inherited disease controlled by a recessive allele. The diagram, Fig. 3.1, shows how the disease has been inherited in a family. Males are shown as circles and females as squares.

Individuals suffering from PKU are shown by circles or squares coloured black. Carriers of PKU are shown half-black.

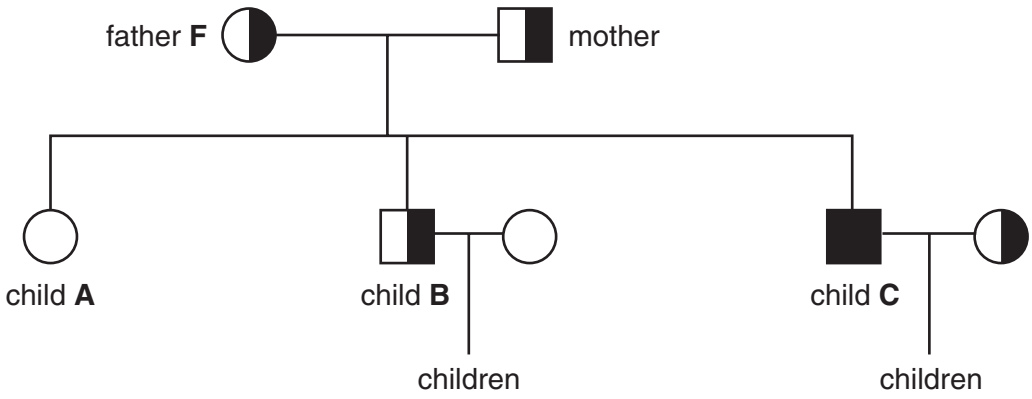

Fig. 3.1

(a) Explain what the genetic terms *dominant* and *recessive* mean.

dominant .....

.....

recessive .....

.....[2]

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(b) What are the genotypes of the following individuals?

In your answer use **P** to represent the dominant allele and **p** to represent the recessive allele.

(i) father **F**

.....[1]

(ii) child **A**

.....[1]

(c) When child **C** has a son, his chance of suffering from PKU is 50%.

Use a diagram to help you explain why.

[3]

(d) What is the chance of a son of child **B** suffering from PKU?

.....[1]

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4 The diagram, Fig. 4.1 shows the water cycle.

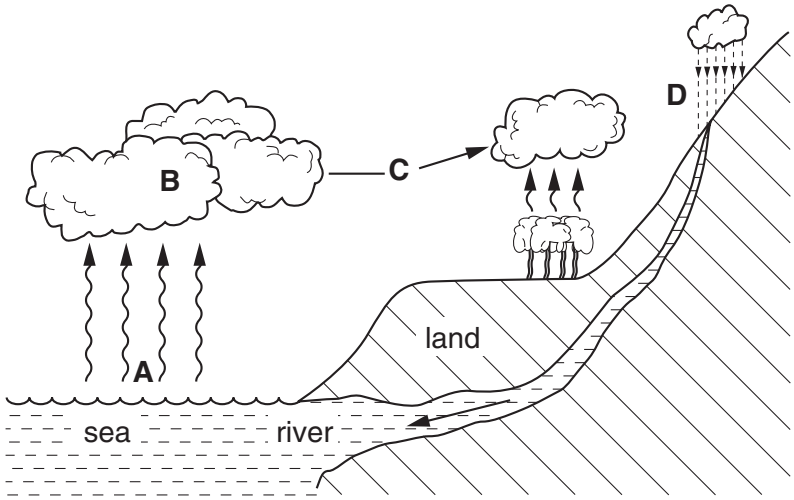

Fig. 4.1

(a) Name the processes taking place at **A**, **B**, **C** and **D**.

A .....

B .....

C .....

D .....[4]

(b) Describe and explain **one** effect that deforestation may have on the water cycle.

.....

.....

.....[2]

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5 A student cut five similar-sized pieces of potato and weighed each one.

He placed each piece of potato in a different concentration of sugar solution for 60 minutes.

He then re-weighed each piece of potato.

His results are shown in the table in Fig. 5.1.

concentration of sugar in mol / dm^3	mass of potato in g		percentage change in mass
	start	finish	
0.0	6.37	7.16	12.4
0.2	6.12	6.58	7.5
0.4	6.27	6.42	
0.6	6.26	6.10	–2.6
0.8	6.33	5.85	–7.6

Fig. 5.1

(a) (i) Calculate the percentage change in mass for a sugar concentration of 0.4 mol / dm^3.

percentage change = ... [2]

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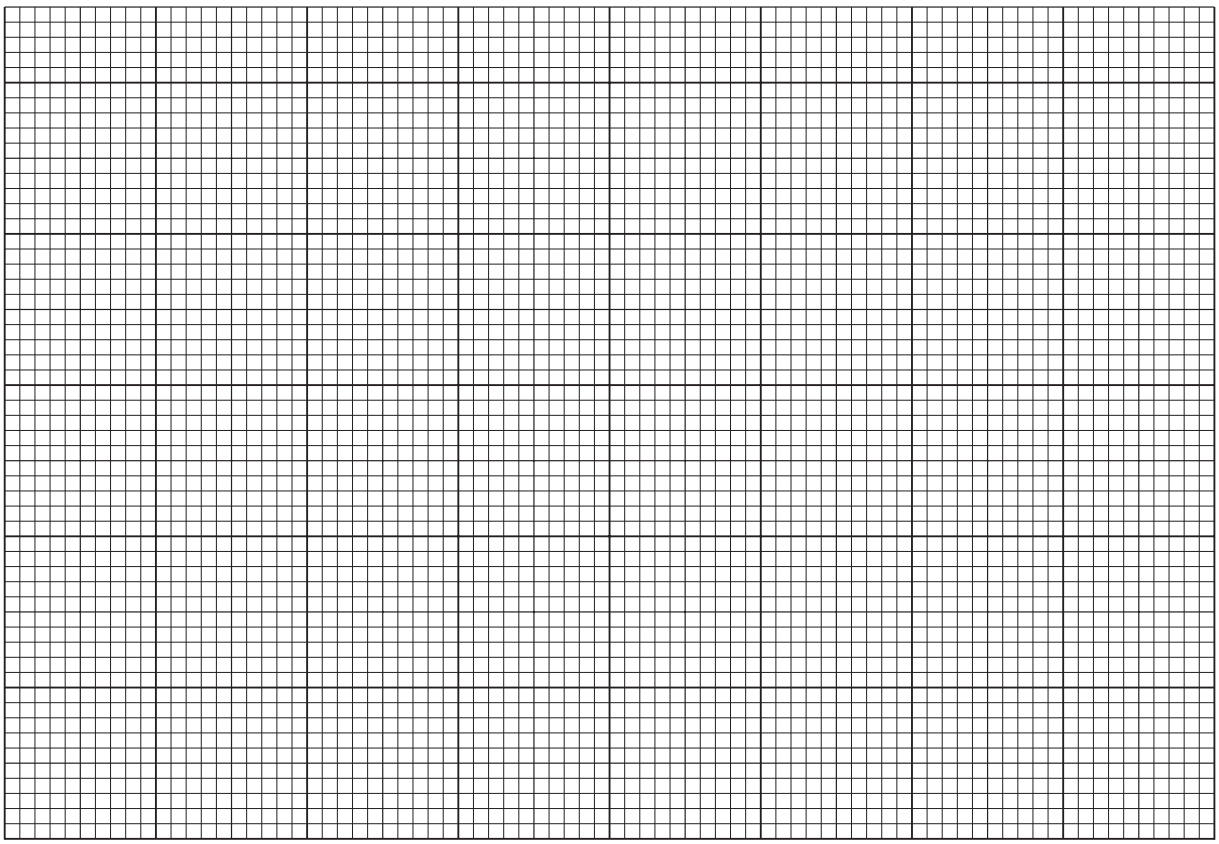
(ii) Use the grid to plot concentration of sugar (horizontal axis) against percentage change in mass.

Draw a line through the points.



[3]

(b) (i) Name the process that caused the change in mass of the potato pieces.

.....[1]

(ii) Explain why some of the potato pieces **gained** in mass.

.....

.....

.....[2]

(c) Another piece of potato treated in a similar way gained 4.8% in mass.

Use your graph to suggest what concentration of sugar solution this piece of potato was placed in.

.....[2]

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6 **(a)** Eating too much fat and too little fibre can both cause malnutrition.

Describe the effect each is likely to have.

(i) eating too much fat

.....[1]

(ii) eating too little fibre

.....[1]

(b) Name three components, other than fat and fibre, essential for a balanced diet.

1. .....

2. .....

3. .....[3]

(c) Describe the function of each of the following parts of the human alimentary canal.

(i) salivary glands

.....

.....

.....[2]

(ii) ileum

.....[1]

(iii) colon

.....[1]

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Section B

Answer **two** questions from this section.

Write your answers on the separate answer paper provided.

7 **(a)** List **four** components of blood and describe the functions of each. [8]

(b) Describe coronary heart disease and suggest a possible cause. [2]

8 **(a)** What is a hormone?

Suggest one way in which the action of hormones differs from that of nerves. [5]

(b) Describe examples of situations in which the hormone adrenaline is released. Explain how the release of this hormone helps a person in these situations. [5]

9 The table in Fig. 9.1 shows results from an investigation into the effect of a nitrogen-containing fertiliser on the growth of plant seedlings.

mass of fertiliser used / g	height of seedling / cm
0	6.5
0.2	9.1
0.5	15.6
0.7	18.2
1.2	19.5
1.8	19.5

Fig. 9.1

(a) Describe how this investigation should be carried out in order to obtain accurate and reliable results. [6]

(b) Use the information in the table to help you describe and explain the effect of nitrogen compounds on the growth of seedlings. [4]

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