

Candidate Name _____

Centre Number	Candidate Number

CAMBRIDGE INTERNATIONAL EXAMINATIONS
Joint Examination for the School Certificate
and General Certificate of Education Ordinary Level

BIOLOGY
PAPER 2

5090/2

OCTOBER/NOVEMBER SESSION 2002

1 hour 45 minutes

Additional materials:
 Answer paper

TIME 1 hour 45 minutes

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Section A

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

Section B

Answer **three** questions.

Write your answers on the separate answer paper provided.

At the end of the examination,

- fasten all separate answer paper securely to the question paper;
- write an E (for Either) or an O (for Or) next to the number 8 in the grid below to indicate which question you have answered.

INFORMATION FOR CANDIDATES

The intended number of marks is given in brackets [] at the end of each question or part question.

You are advised to spend no longer than one hour on Section A and no longer than 45 minutes on Section B.

FOR EXAMINER'S USE	
Section A	
Section B	
6	
7	
8	
TOTAL	

This question paper consists of 12 printed pages.



Section A

Answer **all** the questions.

Write your answers in the spaces provided.

- 1 Fig. 1.1 shows an apparatus used to investigate fermentation, a form of anaerobic respiration that can take place in the cytoplasm of yeast cells.

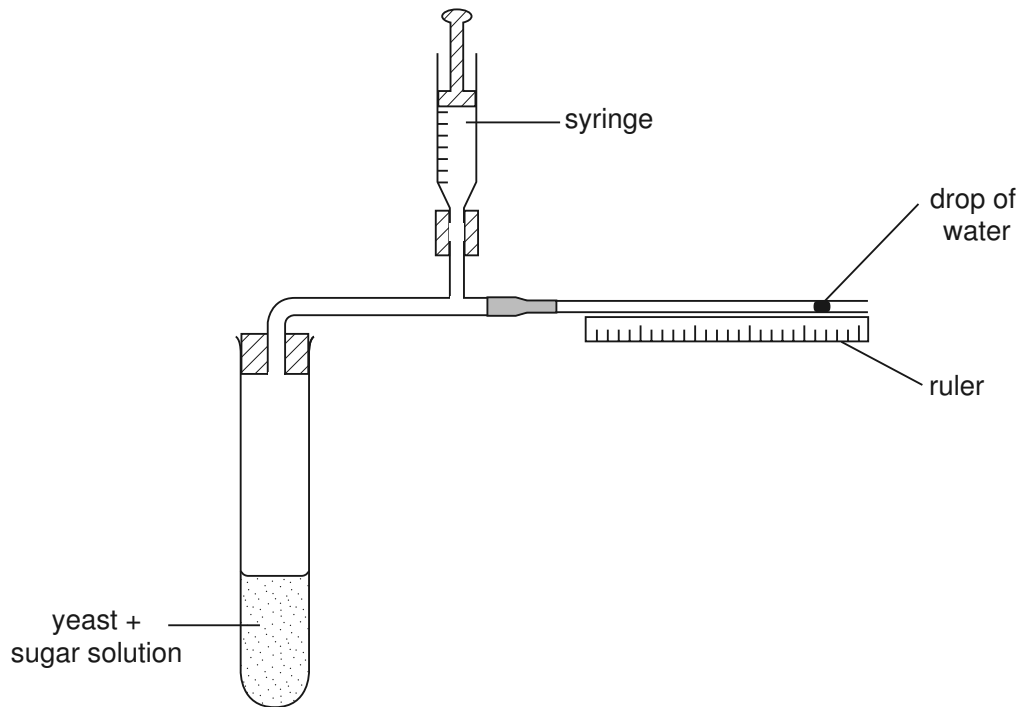


Fig. 1.1

(a) Name the gas given off during fermentation.[1]

(b) State the use of the syringe in this apparatus.
.....[1]

(c) In each case, state and explain the effect on fermentation of raising the temperature

(i) from 20 °C to 45 °C;

effect

explanation

.....

(ii) from 45 °C to 70 °C.

effect

explanation

.....

[4]

Using the apparatus in Fig. 1.1, an experiment was carried out at 30 °C with each of three different sugars, **E**, **F** and **G**, all at the same concentration.

Table 1.1 shows the distances moved by the drop of water over equal periods of time for each of the sugars.

Table 1.1

sugar	distance / mm
E	250
F	50
G	0

One of the sugars was glucose. Glucose molecules are approximately half the size of the molecules of the other two sugars.

(d) State which sugar, **E**, **F** or **G**, is most likely to be glucose and give a reason for your answer.

sugar

reason

.....[2]

(e) Suggest why no gas was given off when sugar **G** was used.

.....[1]

[Total : 9]

- 2 Fig. 2.1 shows the chromosomes of a human body cell (with matching chromosomes placed side-by-side in pairs).

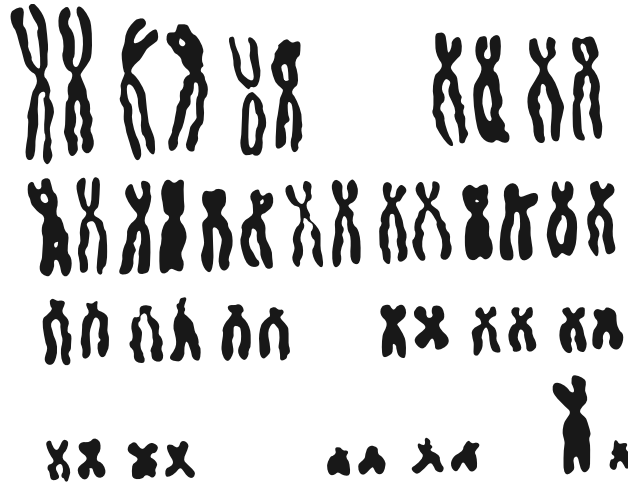


Fig. 2.1

- (a) Name the part of the cell in which chromosomes are found.
[1]
- (b) State the sex of the person from whom this cell was taken. Give a reason for your answer.
sex of person
reason[2]
- (c) Explain how it is possible to tell that this person does **not** suffer from Down's syndrome.

[1]
- (d) Describe how the chromosomes in a gamete from the same person would differ in appearance from Fig. 2.1.
[1]

(e) Fig. 2.2 shows the chromosomes from a body cell of a species of insect.



Fig. 2.2

With reference to Figs. 2.1 and 2.2, suggest why gametes from a male and a female of different species usually cannot produce a zygote.

.....
.....[1]

[Total : 6]

3 Fig. 3.1 shows a section through the human eye.

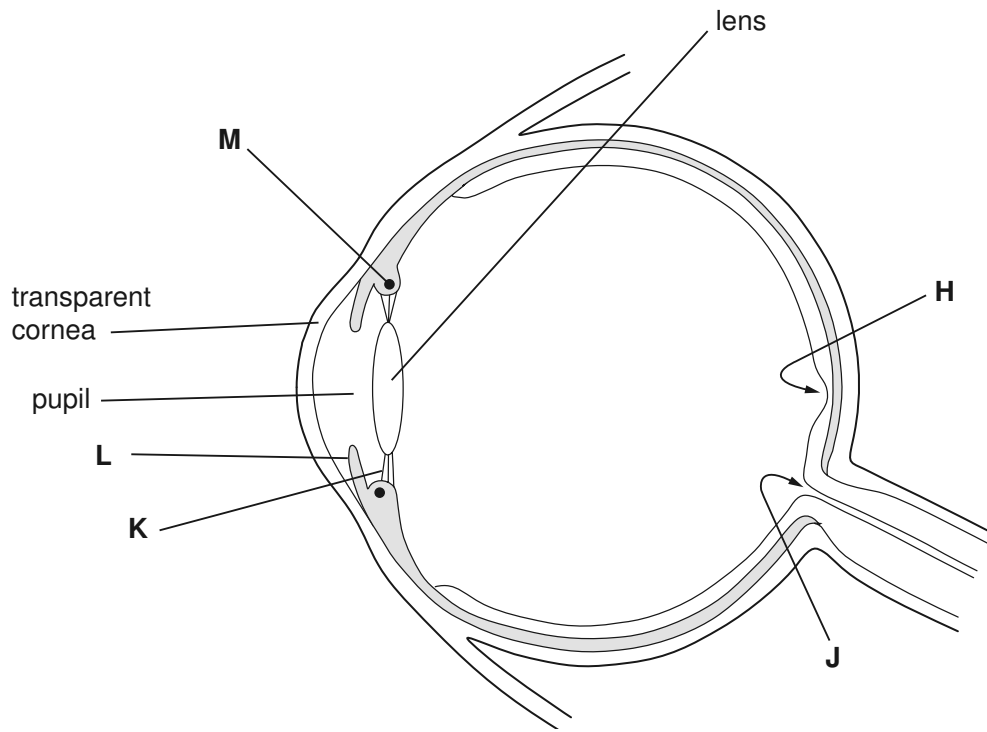


Fig. 3.1

(a) Identify structures H, J, K and L.

H

J

K

L

[4]

(b) Using information in Fig. 3.1, state, with an explanation in each case, whether the eye

(i) is looking at a near or distant object;

near or distant object

explanation

.....

(ii) is in bright or dim light.

bright or dim light

explanation

.....

[2]

(c) Explain what is occurring in structures **K**, **L** and **M** for the eye to appear as shown in Fig. 3.1.

K

.....

L

.....

M

.....[6]

(d) (i) State which part of the eye contains light-sensitive cells.

.....

(ii) Explain why a person is not normally aware of a blind spot in their field of vision.

.....

.....

.....

[2]

[Total : 14]

4 Fig. 4.1 shows the appearance of stomata of two plants over a 24-hour period. The plants are growing side-by-side, but are of different species.

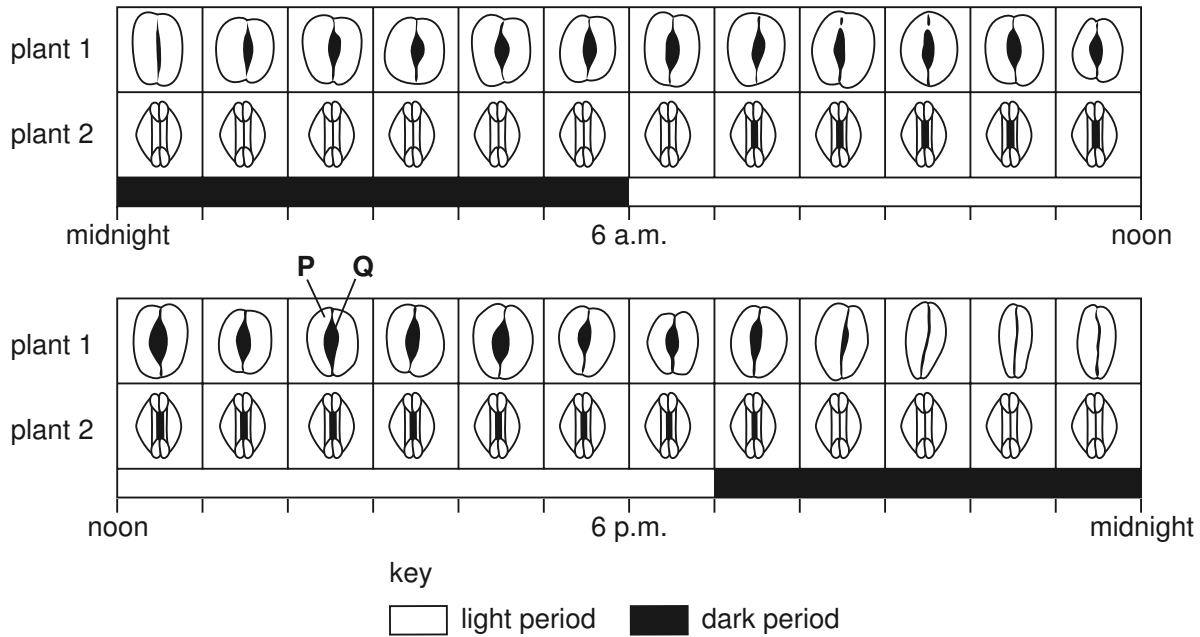


Fig. 4.1

(a) Name P and Q.

P

Q

[2]

(b) (i) Name a process that can occur in plant 1 between 1 a.m. and 5 a.m. that might not occur during this time in plant 2. Explain your answer.

process

explanation

.....

(ii) Name another process that can occur in plant 1 between 6 a.m. and 7 a.m. that might not occur during this time in plant 2. Explain your answer.

process

explanation

.....

[4]

(c) Suggest and explain what effect a shortage of soil water might have on the size of stomatal pores in plant 1.

effect

explanation

.....

.....[2]

[Total : 8]

5 Fig. 5.1 shows different types of human teeth.

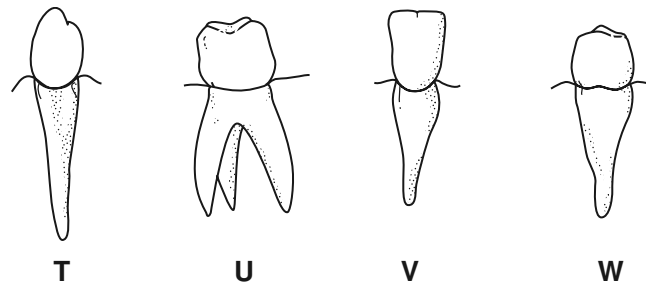


Fig. 5.1

(a) Name the types of tooth shown.

T

U

V

W

[4]

Fig. 5.2 shows a view from above of teeth in a human lower jaw.

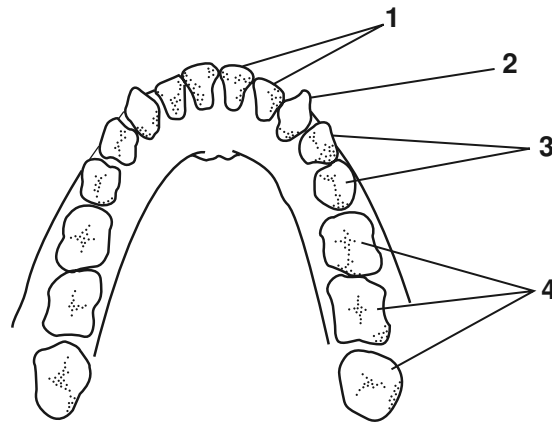


Fig. 5.2

(b) By matching each letter from Fig. 5.1 with a number from Fig. 5.2, complete Table 5.1 to show the position occupied by each type of tooth.

Table 5.1

type of tooth	position number
T	
U	
V	
W	

[2]

(c) (i) State which type of tooth is used for grinding the walls of plant cells.

.....

(ii) Suggest why grinding is important in animals that are herbivores.

.....

.....

[2]

(d) (i) Name the enzyme that is found in the mouth cavity and state its substrate and product.

enzyme

substrate

product

(ii) Explain why the reaction that this enzyme catalyses does **not** occur in the stomach, but does occur in the duodenum.

.....

.....

.....

[5]

[Total : 13]

Section B

Answer **three** questions.

Question **8** is in the form of an **Either/Or** question. Only one part should be answered.

Write your answers on the separate answer paper provided.

- 6** (a) Describe, with examples, the difference between *continuous variation* and *discontinuous variation*. [6]
- (b) Explain how variation within one species may eventually lead to the development of two separate species. [4]
- [Total : 10]
- 7** (a) Describe the functions of the testes. [3]
- (b) Describe the part played by the uterus in the development of an embryo from the time of ovulation to the birth of the baby. [7]
- [Total : 10]
- 8** **Either** (a) List the main characteristics of bacteria. [4]
- (b) Describe the role of bacteria in
- (i) decomposition;
- (ii) yoghurt production. [6]
- [Total : 10]
- Or** (a) List the main characteristics of fungi. [4]
- (b) Describe the use of fermenters in the production of
- (i) antibiotics;
- (ii) single cell protein. [6]
- [Total : 10]