

Centre No.								Paper Reference	Surname	Initial(s)			
Candidate No.						7	0	4	0	/	0	2	Signature

Paper Reference(s)

7040/02

London Examinations GCE

Biology

Ordinary Level

Paper 2

Tuesday 11 May 2010 – Morning

Time: 2 hours

Examiner's use only

--	--	--

Team Leader's use only

--	--	--

Question Number	Leave Blank
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total	

Materials required for examination
Nil

Items included with question papers
Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initial(s) and signature. Check that you have the correct question paper. The paper is arranged in THREE sections, A, B and C. In Section A, answer ALL questions. In Section B, answer any TWO questions. In Section C, answer any TWO questions. Write your answers in the spaces provided in this question paper. Do not use Pencil. Use blue or black ink. In Sections B and C, indicate which question you are answering by marking the box (X). If you change your mind, put a line through the box (X) and then indicate your new question with a cross (X).

Information for Candidates

Calculators may be used. The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2). There are 12 questions in this question paper. The total mark for this paper is 100. There are 28 pages in this question paper. Any blank pages are indicated.

Advice to Candidates

Write your answers neatly and in good English. In calculations, show all the steps in your working.

This publication may be reproduced only in accordance with Edexcel Limited copyright policy. ©2010 Edexcel Limited.

Printer's Log. No.
N38246A

W850/U7040/57570 5/5/4/



Turn over

edexcel
advancing learning, changing lives

SECTION A

Answer ALL questions in this section.

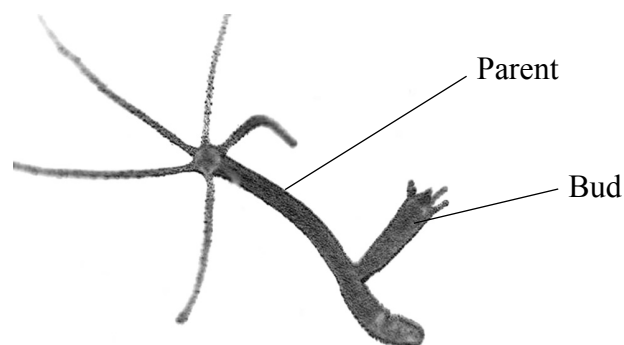
1. Read the passage below. Use the information in the passage and your own knowledge to answer the questions that follow.

Asexual reproduction

- 1 Many plants and some animals are able to reproduce by asexual reproduction, without the process of sexual reproduction, even though they are capable of sexual reproduction.

- 5 For asexual reproduction, the simplest method is just splitting in two. This is known as binary fission. This is used by organisms such as *Pleurococcus*, *Amoeba* and bacteria.

- 10 Some animals can reproduce asexually. An example is *Hydra*. In this process, a small bud develops on the side of the organism. The parent and the bud share the food they catch with their tentacles. When the bud is fully developed, it separates from the parent and continues life as an independent animal.



- 15 Some plants reproduce asexually using special underground organs. The potato is an example. It produces underground tubers, which are swollen ends of underground stems. These tubers have small scale leaves and buds. These buds eventually sprout to give rise to new shoots and roots and then develop into a new plant. Another example is found in plants that produce bulbs. Bulbs are made up of swollen leaves attached to a very short underground stem. The bulb produces new leaves and flowers above the ground. The bulb also has small buds below the ground, which develop into new bulbs and eventually split off from the parent.

- 20 Many plants are able to form roots from parts cut from a parent plant. Gardeners and farmers take advantage of this. Use of 'cuttings' is known as artificial propagation. A cut shoot is placed in damp soil, often with a special 'rooting powder' and it will eventually grow into a new plant. Some trees and shrubs are propagated in the same way by planting shoots.



Leave
blank

(a) Describe how sexual reproduction differs from asexual reproduction (lines 1 to 2).

.....
.....
.....
.....

(2)

(b) Asexual reproduction relies on some part of the organism growing and producing a new cell or cells. This cell division is called mitosis. Explain how mitosis differs from meiosis.

.....
.....
.....
.....
.....
.....

(3)

(c) Suggest why many gardeners choose artificial propagation as the method of reproducing their best varieties (lines 19 to 20).

.....
.....
.....
.....
.....
.....

(3)



BLANK PAGE



Leave
blank

(d) (i) Give **one** difference between potato tubers and bulbs (lines 12 to 16).

.....
.....
(1)

(ii) Suggest why potato tubers that are exposed to the light turn green.

.....
.....
(1)

(e) Potato tubers contain large amounts of starch.

(i) Describe a simple test you could carry out to show that a potato tuber contains starch.

.....
.....
.....
.....
(2)

(ii) Suggest how this starch is used to help the tuber grow into a new potato plant.

.....
.....
.....
.....
(2)

(f) Suggest why the plant cutting is placed in 'rooting powder' (line 21).

.....
.....
(1)

(Total 15 marks)

Q1

--	--



Leave blank

2. The table below shows some of the recommended daily dietary requirements for people of different ages.

Person	Energy in joules	Protein in g	Calcium in mg	Iron in mg	Vitamin A in μg	Vitamin D in μg
Boy aged 12 to 14	11 725	70	700	14	725	2.5
Girl aged 12 to 14	9 630	58	700	14	725	2.5
Man	12 560	75	500	10	750	2.5
Woman	9 210	55	500	12	750	2.5

- (a) Suggest why there is a difference in the energy requirements of the boy and girl.

.....
.....
.....
.....

(2)



Leave blank

(b) Give a reason for each of the following differences.

(i) The protein requirements of the girl and the woman

.....
.....
(1)

(ii) The calcium requirements of the boy and the man

.....
.....
(1)

(iii) The iron requirements of the woman and the man

.....
.....
(1)

(c) What would be the result if a person did not take in enough Vitamin D?

.....
.....
(1)

(d) The energy values given in this table are average values for people in certain categories. Suggest **one** factor that could alter the energy requirement and explain how it would change the value.

.....
.....
.....
.....
(2)

(Total 8 marks)

Q2



BLANK PAGE



Leave
blank

3. Springtails are small animals that live in the soil and eat dead plants. Springtails are eaten by other small animals called mites.

(a) (i) Use this information to draw the food chain for these organisms in the space below.

(2)

(ii) Which organism in the food chain is the primary consumer?

.....
(1)

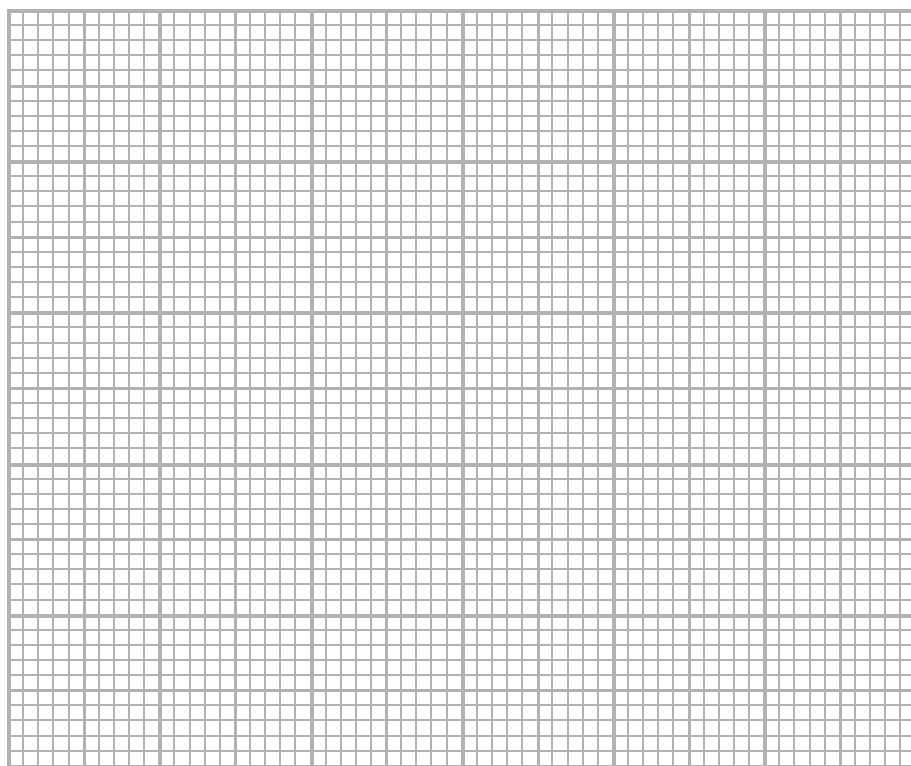


Leave blank

- (b) A field was sprayed with pesticide. Students used quadrats to estimate the population size of springtails and mites living in the soil of the field. They did this every two months for a year. The results are shown in the table below.

Time in months (from spraying)	Estimated number of soil animals in the field	
	Springtails	Mites
0	5200	5000
2	4800	3800
4	4700	2500
6	5200	2600
8	6500	5000
10	10000	5100
12	6500	5000

- (i) Use the information in the table to plot a line graph on the grid below. Join the points using straight lines.



(5)



Leave
blank

(ii) Describe the changes in the number of springtails during the year and suggest reasons for each of these changes.

.....
.....
.....
.....
.....
.....
.....
.....
.....

(4)

(iii) The estimates of population size are reliable only if the students used the quadrat technique correctly. Describe **two** things the students should have done to ensure that they used the quadrats correctly.

1

.....

2

.....

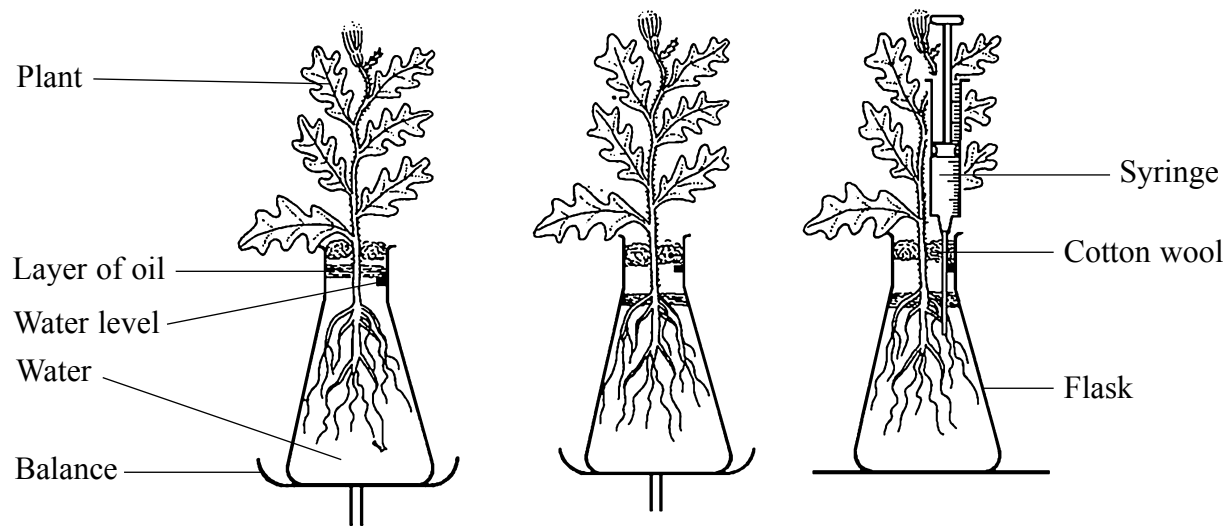
(2)

Q3

(Total 14 marks)



4. The diagram below shows stages of the investigation of water loss from a plant with roots. This is done by looking at changes in mass over time.



Stage A
Record original mass of plant plus flask at start.
Mark water level.

Stage B
Note change in mass after 20 hours.

Stage C
Add water until water level is restored.
Note volume added.

(a) Suggest why there is a layer of oil on top of the water in the flask.

.....
.....

(1)



Leave
blank

(b) At the start of the experiment the original mass of the plant + water + flask = 332 g

The apparatus was left in a laboratory for 20 hours after which the mass had changed.

After 20 hours, the new mass of the plant + water + flask = 309 g

(i) Calculate the change in mass of the apparatus.

.....
(1)

(ii) Calculate the rate of loss of mass in grams per hour.

.....
(1)

(c) The student thought the change in mass was due to loss of water by transpiration from the plant. However, the volume of water that needed to be added to restore the original water level in the flask was 1.3 cm³ greater than expected from the change in mass. Assume that 1 cm³ has a mass of 1 g.

Suggest an explanation for these results.

.....
.....
.....
.....
.....
.....
(3)

(d) How would you expect the results of the experiment to be different if the experiment was repeated using the same plant but in a laboratory with low light intensity and at the same temperature.

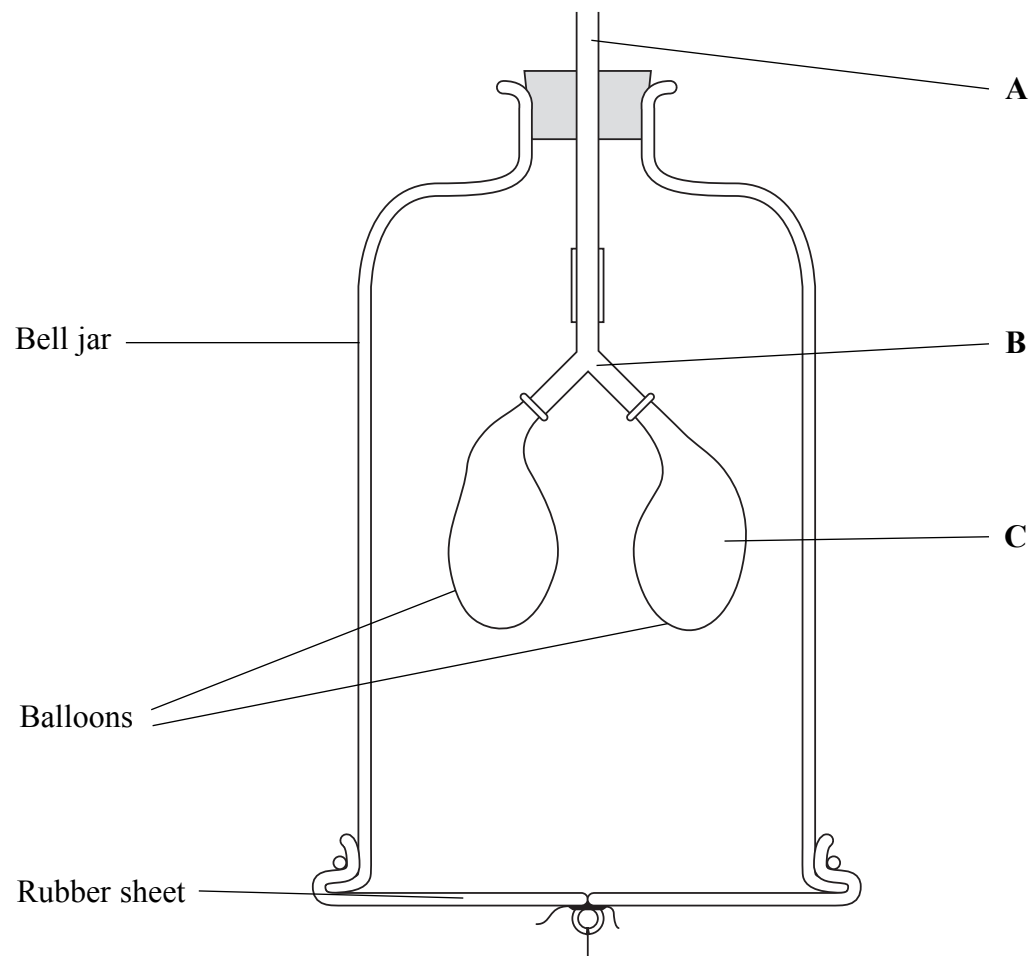
.....
.....
.....
.....
(2)

(Total 8 marks)

Q4



5. The apparatus below can be used as a model to demonstrate the functioning of the diaphragm.



(a) Name the structures found in the human thorax that are represented by the following parts of the model.

A

B

C

(3)

(b) Explain the effect of pulling down the rubber sheet.

.....

.....

.....

.....

(2)



Leave
blank

(c) Other structures, not shown in the model, are also involved in ventilation. Explain how they help in this process.

.....
.....
.....
.....
.....
.....

(3)

(d) Explain how a short period of exercise can affect breathing rate.

.....
.....
.....
.....

(2)

(Total 10 marks)

Q5

--	--



BLANK PAGE

TURN OVER FOR SECTION B



Leave
blank

SECTION B

Answer TWO questions in this section. If you change your mind, put a line through the box (~~☒~~) and then indicate your new question with a cross (☒).

If you answer Question 7, put a cross in this box ☒ .

7. (a) Explain how gas exchange differs from respiration.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(4)

(b) Explain how excretion differs from egestion.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(4)

(Total 8 marks)

Q7



Leave
blank

If you answer Question 8, put a cross in this box .

8. (a) Describe the advantages of using biological control rather than chemicals to kill pests.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(4)

- (b) Describe how a cloned organism differs from a transgenic organism.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(4)

Q8

(Total 8 marks)



Leave
blank

If you answer Question 9, put a cross in this box .

9. (a) Explain the differences between immunity and resistance.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(4)

(b) By reference to suitable examples, explain how a pathogenic disease differs from a lifestyle disease.

.....
.....
.....
.....
.....
.....
.....
.....
.....
.....

(4)

(Total 8 marks)

Q9

TOTAL FOR SECTION B: 16 MARKS



BLANK PAGE

TURN OVER FOR SECTION C





Leave
blank

If you answer Question 11, put a cross in this box ☒ .

11. Describe methods used to increase crop production.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....



BLANK PAGE

