



Centre Number

71

Candidate Number

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Human Activity and Health

Module 2

Higher Tier

[GSC22]

TUESDAY 8 NOVEMBER 2011

2.30 pm–3.15 pm



TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

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

Answer **all seven** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 45.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's
use only

Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

Total
Marks

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1 Fig. A shows newly emerged seedlings surrounding their parent tree.

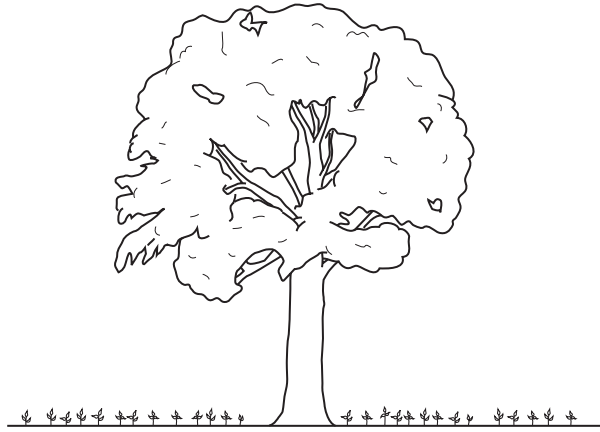


Fig. A

Fig. B shows the seedlings a year later under the same tree.

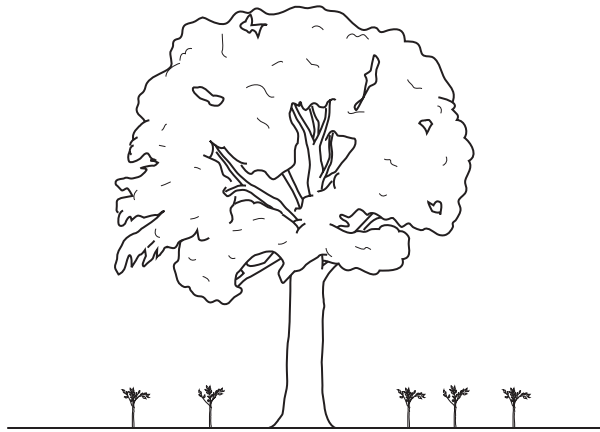


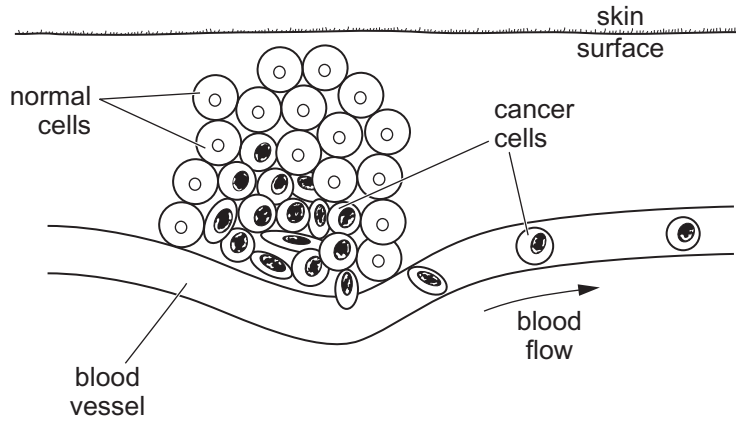
Fig. B

Describe and explain the differences in the number and distribution of seedlings between Figs. A and B.

[4]

Examiner Only	
Marks	Remark

2 (a) The following diagram represents skin cancer.



(i) Use the diagram to suggest how cancer can spread to other parts of the body.

_____ [1]

(ii) Explain how skin cancer cells develop.

_____ [3]

(iii) Suggest one reason why the number of people from Northern Ireland getting skin cancer is increasing.

_____ [1]

(b) Name the condition caused by having one extra chromosome in **each** body cell.

_____ [1]

Examiner Only	
Marks	Remark

(c) Siobhan is to visit Africa for the first time.

(i) Suggest why she should have a number of new vaccinations before travelling.

[2]

(ii) Explain why these vaccinations have to be given several weeks before she goes on holiday.

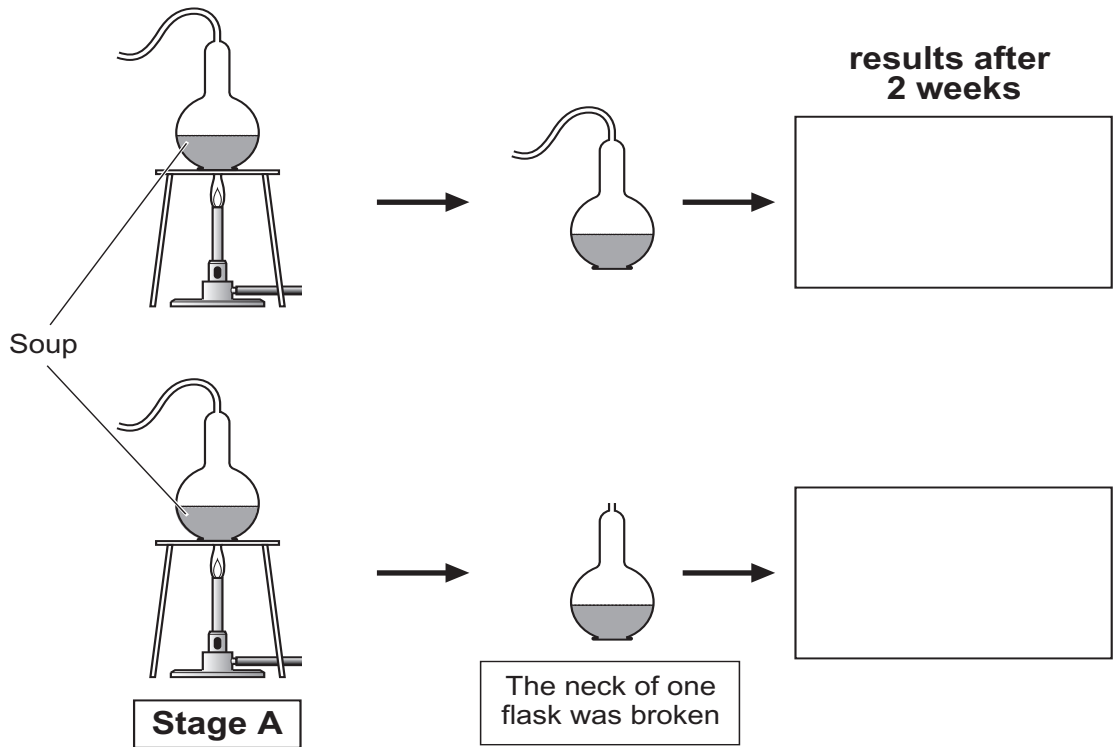
[1]

(iii) Suggest why vaccinations such as MMR are free but many travel vaccinations have to be paid for.

[1]

Examiner Only	
Marks	Remark

3 The following experiment was carried out in a science class.



Adapted from: © GCSE biology for CCEA by R McIlwaine & J Napier, page 69, published by Hodder & Stoughton, 2003. ISBN 9780340858257. Reproduced by permission of Hodder Education

(a) Explain why the flasks and their contents are boiled for 10 minutes in **Stage A**.

_____ [1]

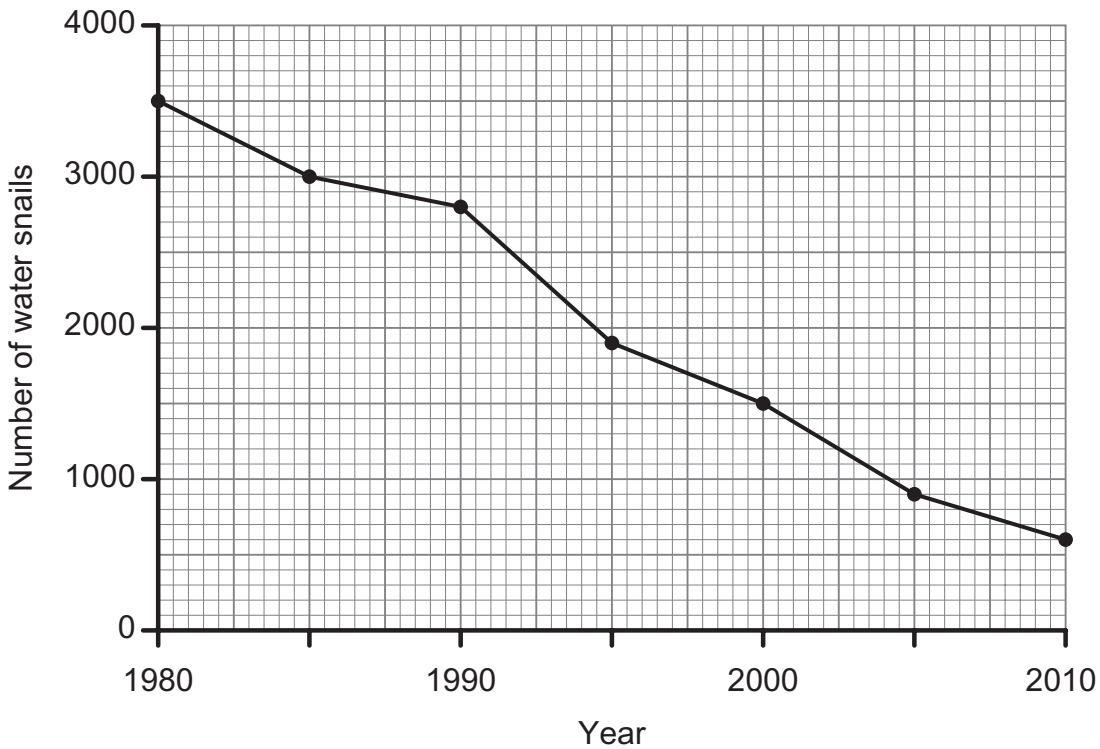
(b) Complete the boxes on the diagram to describe the results you would expect after two weeks. [2]

(c) About one hundred and fifty years ago Louis Pasteur carried out a similar experiment. Explain fully the conclusion he made from his experiment.

 _____ [2]

Examiner Only	
Marks	Remark

4 The graph below shows how the number of water snails has changed in a Northern Ireland river over the last thirty years.



(a) On average the number of snails is falling by around 100 per year. Based on this trend in which year will the snails become extinct in this river?

Year _____ [1]

(b) It is thought that the water snail is an endangered species due to nitrate pollution.

(i) Snail numbers is an example of a biotic factor. What is meant by the term biotic?

_____ [1]

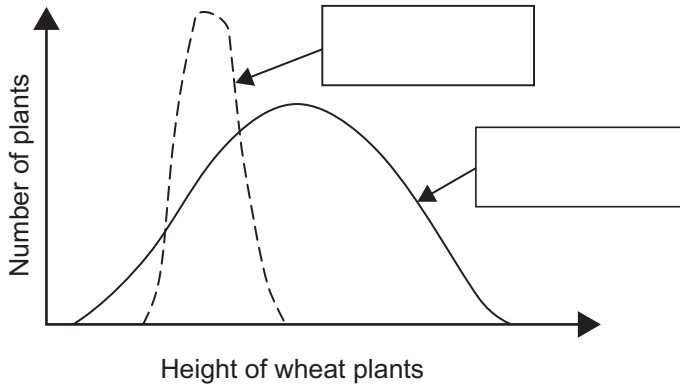
(ii) Suggest one source of nitrate pollution and state how the amount of pollution from this source could be reduced.

 _____ [2]

Examiner Only	
Marks	Remark

5 (a) Over thousands of years man has cultivated wheat with the result that modern wheat plants are much less variable in height than ancient wheat.

(i) On the graph below, label the curves for ancient and modern wheat. [1]



(ii) Use the information provided and your knowledge to describe and explain one advantage of growing the modern wheat variety.

_____ [2]

(iii) Name the type of selection involved. [1]

_____ [1]

(iv) Modern wheat also has a bigger 'grain head' compared to ancient wheat. Explain why this is an advantage. [1]

_____ [1]

(b) (i) Name the scientist who developed the theory of evolution. [1]

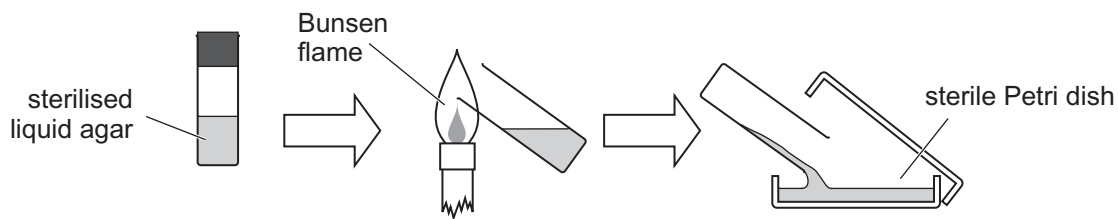
_____ [1]

(ii) Give one reason why the theory of evolution has remained controversial. [1]

_____ [1]

Examiner Only	
Marks	Remark

6 (a) The diagram shows how to pour an agar plate.



(i) Use the diagram to state one thing done to avoid contamination from the air.

_____ [1]

Once the agar hardens the next stage is to transfer bacteria from a culture bottle to the Petri dish.

(ii) Describe how you would do this.

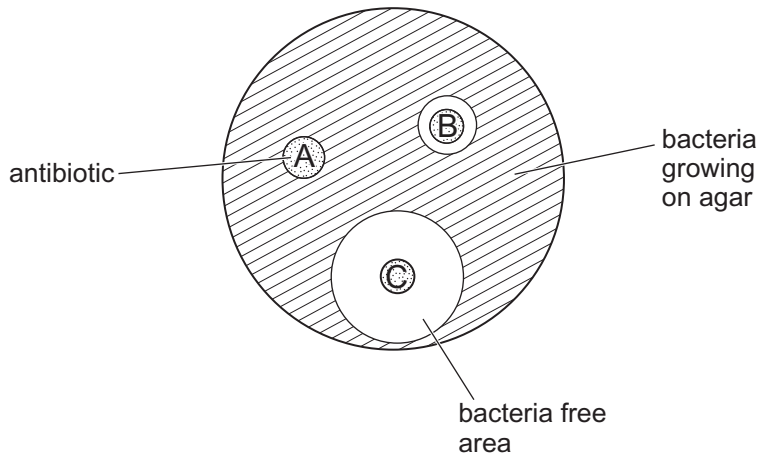
 _____ [3]

(iii) Why should the Petri dish be incubated at no more than 25°C?

_____ [1]

Examiner Only	
Marks	Remark

(b) The following diagram shows the effect of three different antibiotics, A, B and C, on a type of bacteria that causes septic throats in humans.



(i) Based only on the information in the diagram, suggest which antibiotic (A, B or C) scientists would recommend for use in treating patients with septic throats.

_____ [1]

(ii) Suggest one other factor that would have to be taken into account before recommending the use of this antibiotic to treat patients with septic throats.

_____ [1]

(iii) If scientists repeated the experiment, using the same antibiotics, with a 'superbug' such as MRSA, suggest what results they would get.

_____ [1]

(c) Our immune system also helps us defend against disease. Describe the role of phagocytosis in defending against disease.

 _____ [2]

Examiner Only	
Marks	Remark

- 7 A landowner is keen to play his part in helping the environment. He plans to either grow willow in one of his fields as a bio-fuel or to allow the field to revert to 'set-aside'. Willow can be grown and harvested in 3–4 year cycles but it can take up to 20 years for the full range of habitats to regenerate in 'set-aside'.

Outline the benefits of each option for the environment.

Growing willow

'Set-aside'

[5]

THIS IS THE END OF THE QUESTION PAPER

Examiner Only	
Marks	Remark

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