



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Centre Number

71	
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Candidate Number

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Science: Single Award (Modular)

Human Activity and Health

Module 2

Higher Tier

[GSC22]

MONDAY 27 FEBRUARY 2012

11.00 am–11.45 am



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

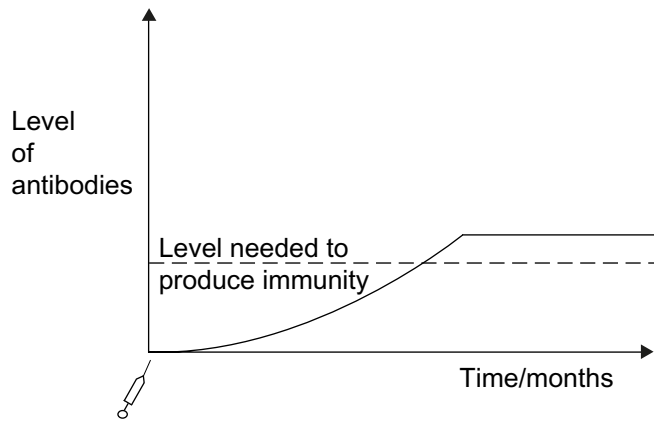
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

Total Marks

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- 1 (a) The following graph shows how the levels of antibody change in the blood following a vaccination.



Use **only** the information provided to answer parts (i) and (ii).

- (i) Give **one** reason why vaccinations for common illnesses are given to babies and young children many months before they are likely to come in contact with infections.

_____ [1]

- (ii) What is the evidence that vaccinations provide long-term protection?

_____ [1]

- (b) Colin got the flu vaccination in September. He gets infected with the flu virus in February. Explain how the vaccination stops him getting ill.

 _____ [4]

Examiner Only	
Marks	Remark

(c) (i) Travellers to certain foreign countries have to get a number of 'travel' vaccinations before they travel.

Explain why these travel vaccinations are necessary.

[2]

(ii) Name the type of immunity that travel vaccinations provide.

[1]

Examiner Only	
Marks	Remark

2 (a) Zebra mussels are an example of a competitive invasive species.



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<http://archive.nics.gov.uk/env/050701b-env.htm>

They have spread across most of the major waterways in Northern Ireland and are damaging natural habitats. Zebra mussels were accidentally introduced into Ireland as a result of human activity. They produce a sticky substance that allows them to attach to hard objects such as rocks and the bottom of boats.

(i) Suggest **one** way that man has helped zebra mussels spread to Ireland.

_____ [1]

(ii) Name **one** other competitive invasive species.

_____ [1]

(iii) State **two** characteristics of competitive invasive species.

_____ [2]

(b) We can monitor the health of the environment by using abiotic and biotic information.

(i) What is meant by a biotic factor?

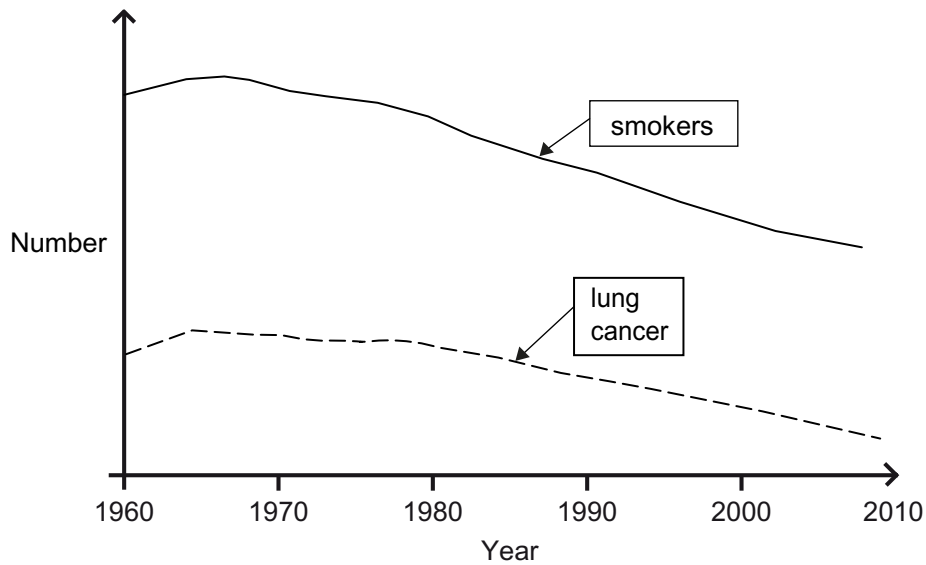
_____ [1]

(ii) Name **one** organism that can be used to monitor pollution levels.

_____ [1]

Examiner Only	
Marks	Remark

3 (a) The following graph shows trends for smoking and lung cancer in men between 1960 and 2010.



(i) Suggest **one** reason why the number of men smoking has fallen in recent years.

_____ [1]

(ii) Over 80% of the men who got lung cancer smoked tobacco. Suggest **one** reason why a non-smoker could get lung cancer.

_____ [1]

(iii) Name **one** other lung disease caused by smoking.

_____ [1]

(b) In an effort to reduce the harm caused by alcohol the Government relaxed the law on closing times for bars and clubs. Many remain open much later than they used to and the bars and clubs in a city centre do not all close at the same time.

Suggest **one** reason how this could help reduce the harm caused by alcohol.

 _____ [1]

Examiner Only	
Marks	Remark

- 4 (a) The table below shows the number and average weight of fish caught by one boat in 2000 and 2010.

Year	Number/ thousands	Average weight/ kg
2000	13.7	0.67
2010	9.8	0.96

- (i) Calculate the increase in the average weight of fish caught from 2000 to 2010.

_____ kg [1]

- (ii) Suggest a reason for this change.

_____ [1]

- (iii) Use the information to suggest why the fishermen are able to make as much profit in 2010 as in 2000 even though they caught fewer fish.

_____ [1]

- (b) We need to maintain world food stocks to feed an increasing human population.

Give **two** reasons why the human population is increasing.

_____ [2]

Examiner Only

Marks Remark

- 5 (a) Complete the carbon cycle showing how the processes of photosynthesis, respiration, fossilisation and combustion remove and add carbon dioxide to the air.

Carbon dioxide
in the air

[3]

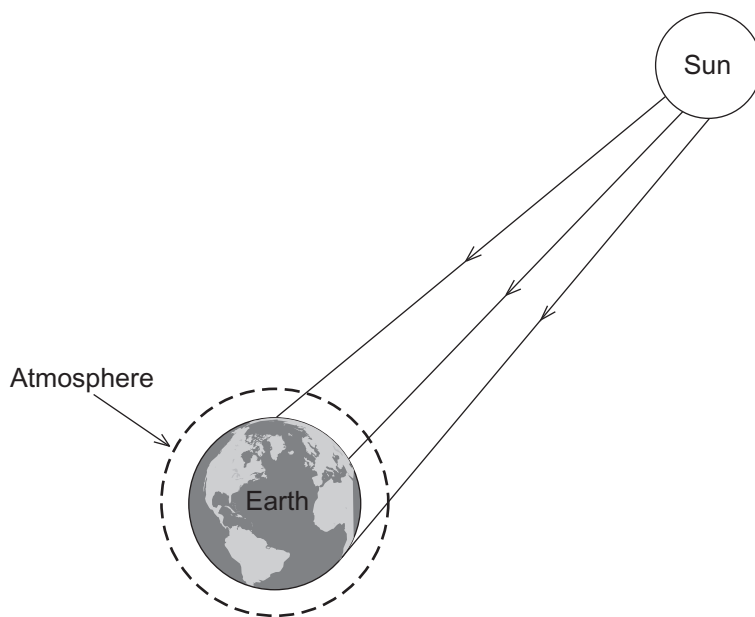
- (b) Global warming occurs because the carbon cycle has become 'unbalanced' over the last 150 years leading to a rise in atmospheric levels of carbon dioxide.

Give **two** reasons why the carbon cycle has become 'unbalanced'.

[2]

Examiner Only	
Marks	Remark

(c) Complete the diagram below to show how rising carbon dioxide levels cause global warming.



© CCEA GCSE Single Award Science by A McFarland, C Murphy & J Napier, page 38, published by Hodder Education, 2009. ISBN 9780340974728. 'Reproduced by permission of Hodder Education'.

[1]

(d) The Kyoto protocol (1997) was an international agreement aimed at slowing down global warming.

Give **one** reason why another agreement is necessary to replace the Kyoto protocol.

_____ [1]

Examiner Only	
Marks	Remark

6 (a) The picture below shows a group of animal rights protesters.



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Examiner Only	
Marks	Remark

(i) Name the stages immediately before and immediately after animal testing in drug development.

Before _____ After _____ [1]

(ii) Apart from ethical considerations, give **one** advantage and **one** disadvantage of using animals in drug development.

_____ [2]

(iii) Give **one** alternative to animal testing.

_____ [1]

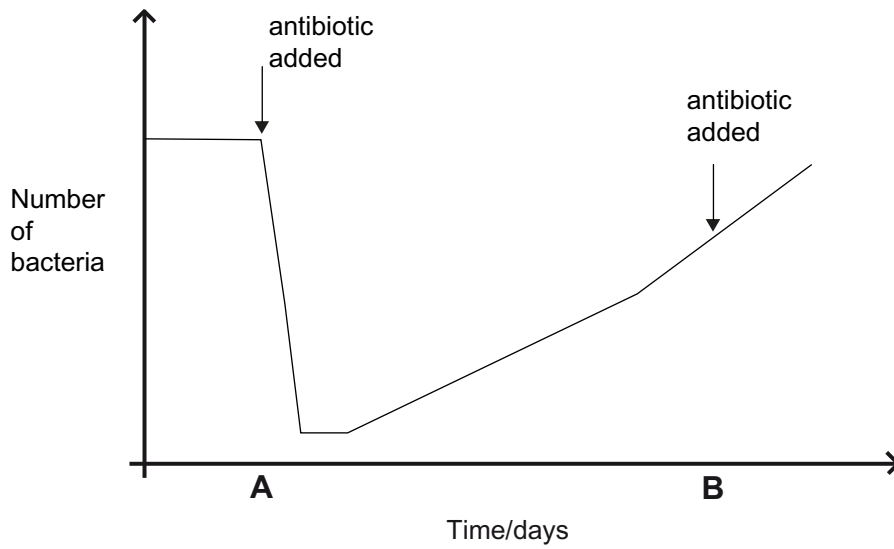
(b) With progress in the genetic profiling of humans (working out each individual’s unique DNA – a sophisticated and costly process) it will soon be possible to ‘tailor’ drug treatment to individual patients. This will mean that the types and strengths of drugs used will be unique to individual patients, i.e. ‘designer drugs’.

Suggest **one** advantage and **one** disadvantage of ‘designer drugs’.

Advantage _____

Disadvantage _____
_____ [2]

7 The following graph shows the effects of an antibiotic on the number of bacteria growing in a Petri dish.



The same type and strength of antibiotic was added to the Petri dish at times A and B.

(a) What is the evidence that a very small percentage of the bacteria were antibiotic resistant at the start of the experiment?

_____ [1]

(b) How does the graph demonstrate:

(i) natural selection?

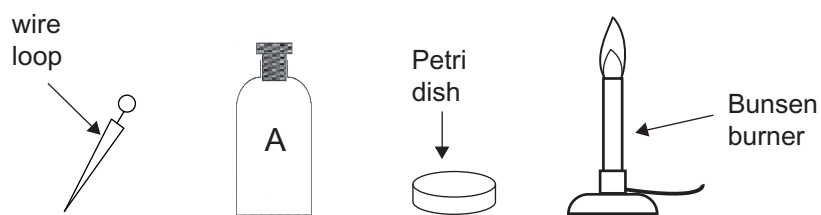
_____ [2]

(ii) evolution?

_____ [2]

Examiner Only	
Marks	Remark

(c) When carrying out experiments on bacteria it is important to use aseptic technique.



The apparatus in the diagram above is used to transfer bacteria from culture bottle A to the Petri dish. State **three** things you would do during the transfer to avoid contamination.

[3]

THIS IS THE END OF THE QUESTION PAPER

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