



Rewarding Learning

General Certificate of Secondary Education
2011–2012

Science: Single Award (Modular)

Human Activity and Health
Module 2

Higher Tier

[GSC22]

TUESDAY 15 MAY 2012, MORNING

Centre Number

71

Candidate Number



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 six** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 45.

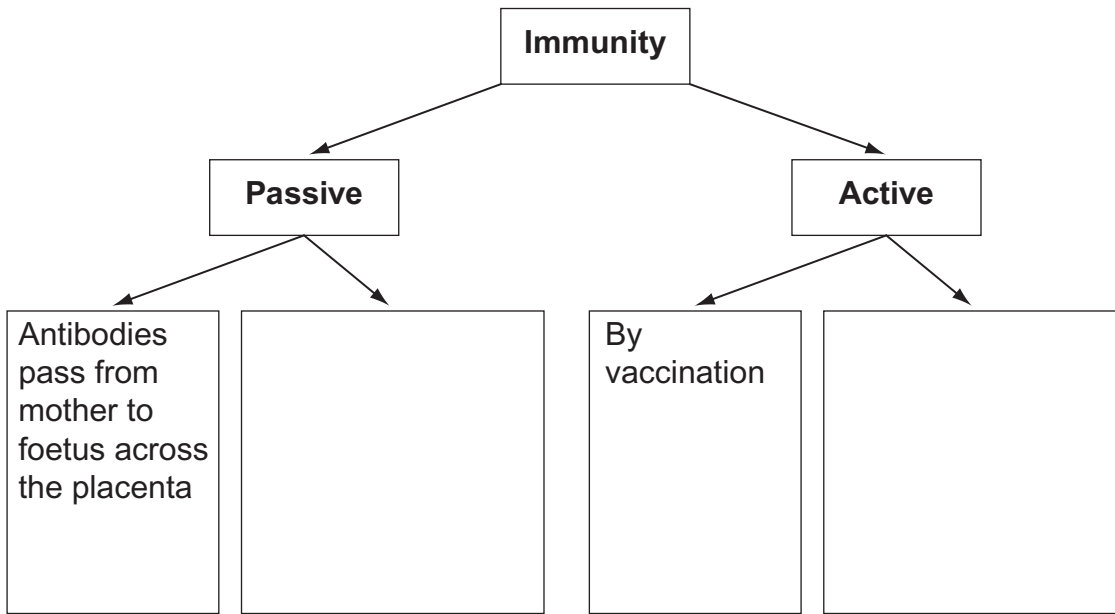
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	

Total Marks	
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1 (a) The following flow chart shows one way that passive immunity is achieved and one way that active immunity is achieved.



(i) Complete the diagram by giving one other way that each type of immunity can be achieved. [2]

(ii) Give one advantage and one disadvantage of passive immunity.

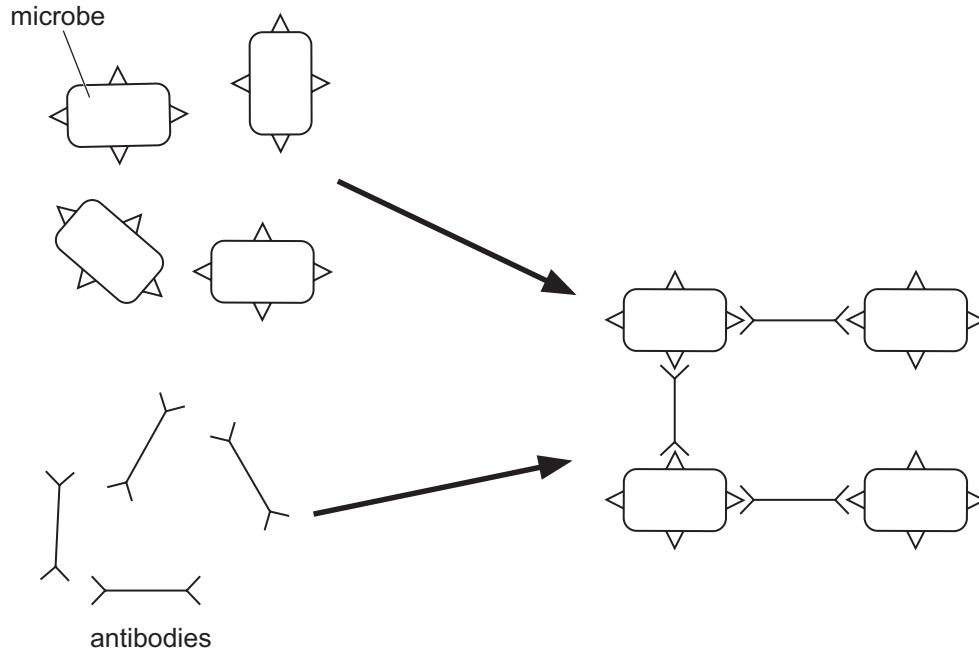
Advantage _____

Disadvantage _____

_____ [2]

Examiner Only	
Marks	Remark

(b) The diagram below shows how antibodies combat microbes.



(i) Use the diagram and your knowledge to explain how antibodies combat microbes.

[3]

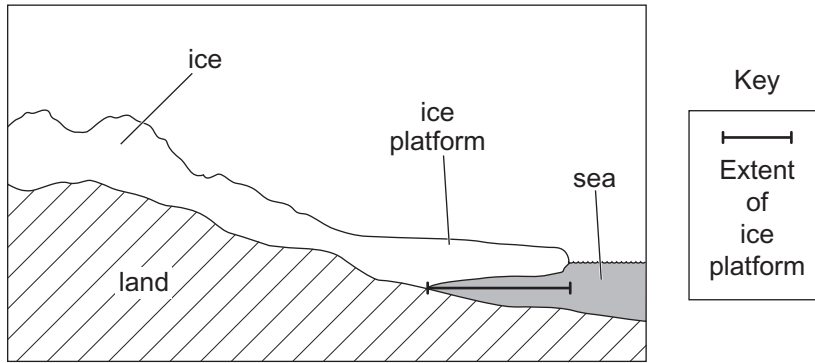
(ii) Name the process in which white blood cells engulf and digest microbes.

[1]

Examiner Only	
Marks	Remark

2 (a) Polar bears hunt seals from ice 'platforms'.

Examiner Only	
Marks	Remark



The table below shows the maximum distance that the ice platform extended beyond an island in the Arctic from 1950–2010.

Year	Extent of ice platform/km
1950	3.5
1960	3.25
1970	2.8
1980	2.6
1990	2.4
2000	2.3
2010	2.2

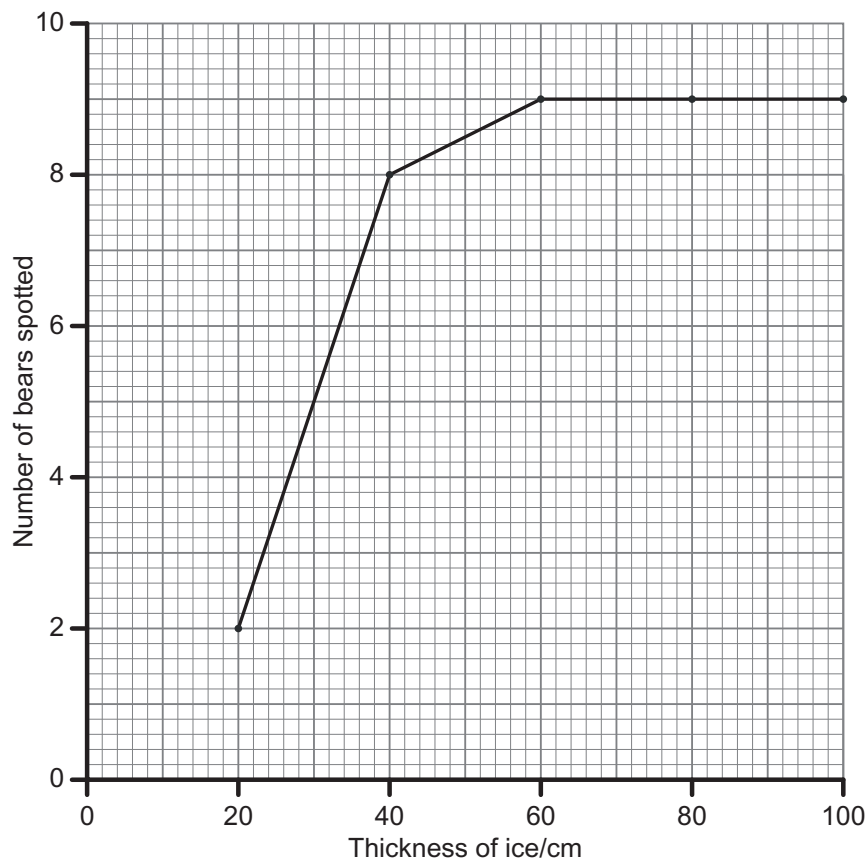
(i) State the trend shown by the information given in the table.

[1]

(ii) It is thought that the change in the ice platform is due to global warming. Explain fully the cause of global warming and how this information shows evidence that it is happening.

[3]

- (b) Scientists also found that the platforms are getting thinner and this has affected the number of polar bears on the ice. The graph below shows the number of polar bears spotted on different thicknesses of ice.



- (i) Suggest a reason why no polar bears have been spotted on ice below 20 cm in thickness.

_____ [1]

- (ii) Suggest what will happen to polar bears if the ice thickness continues to decrease.

_____ [1]

The extent and thickness of ice are examples of abiotic factors.

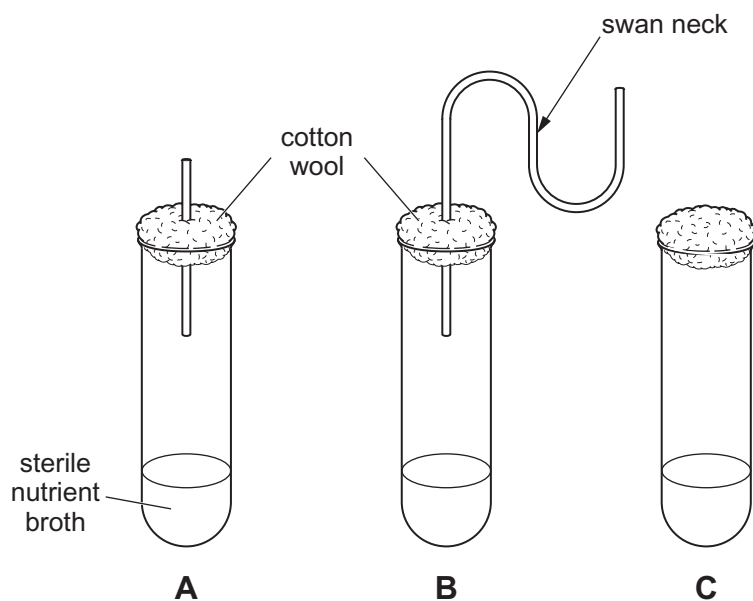
- (iii) What is meant by the term **abiotic**?

_____ [1]

Examiner Only

Marks Remark

- 3 (a) An investigation about microbial growth in nutrient broth was set up as shown.



- (i) Which tube(s) (A, B or C) will contain contaminated broth over a period of time?

[1]

- (ii) In the table below place a tick (✓) beside any action that must be taken to give valid results (to ensure a fair test is carried out).

Action	Tick
Same type of broth used in all tubes	
Same volume of broth used in all tubes	
Tubes kept in darkness during the investigation	
Tubes kept in bright light during the investigation	
Tubes kept at the same temperature during the investigation	
Tubes left for same length of time during the investigation	

[2]

Examiner Only

Marks Remark

(b) Other investigations into microbes led to the discovery of penicillin.
Describe how penicillin was discovered.

[2]

Examiner Only	
Marks	Remark

4 (a) Most textbooks describe acid rain as an example of air pollution.

(i) Suggest why describing acid rain as an example of **air** pollution is not a completely accurate description.

_____ [1]

(ii) Suggest why some countries that have very little industry are affected by acid rain.

_____ [2]

(b) Air pollution is also caused by people smoking.

The table below shows the results of a survey of men who smoke. The survey was taken in a large town.

Year	Percentage of each age group who smoke			
	15–20	21–40	41–60	60+
1990	25	33	32	28
2010	25	26	25	18

(i) Describe the relationship between age and smoking in 2010.

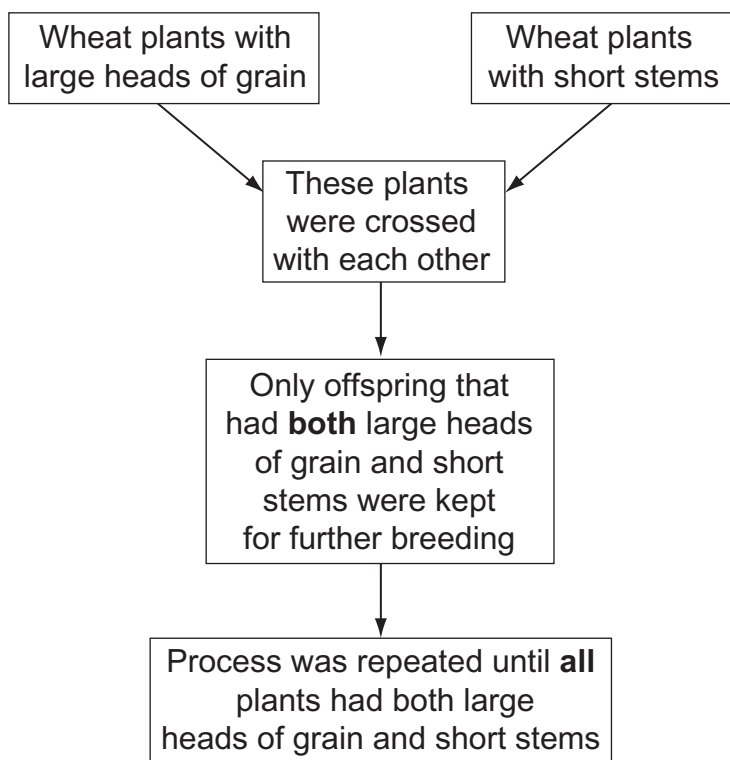
_____ [2]

(ii) Calculate the percentage change in the 60+ age group between 1990 and 2010.

_____ [1]

Examiner Only	
Marks	Remark

- 5 (a) The following flow chart shows how modern wheat plants were produced from ancient varieties by artificial selection.



- (i) Describe and explain **two** advantages to the farmer of using modern wheat instead of the ancient varieties.

1. _____

2. _____

_____ [4]

- (ii) Suggest **one** difference between the type of selection described in wheat and natural selection.

_____ [1]

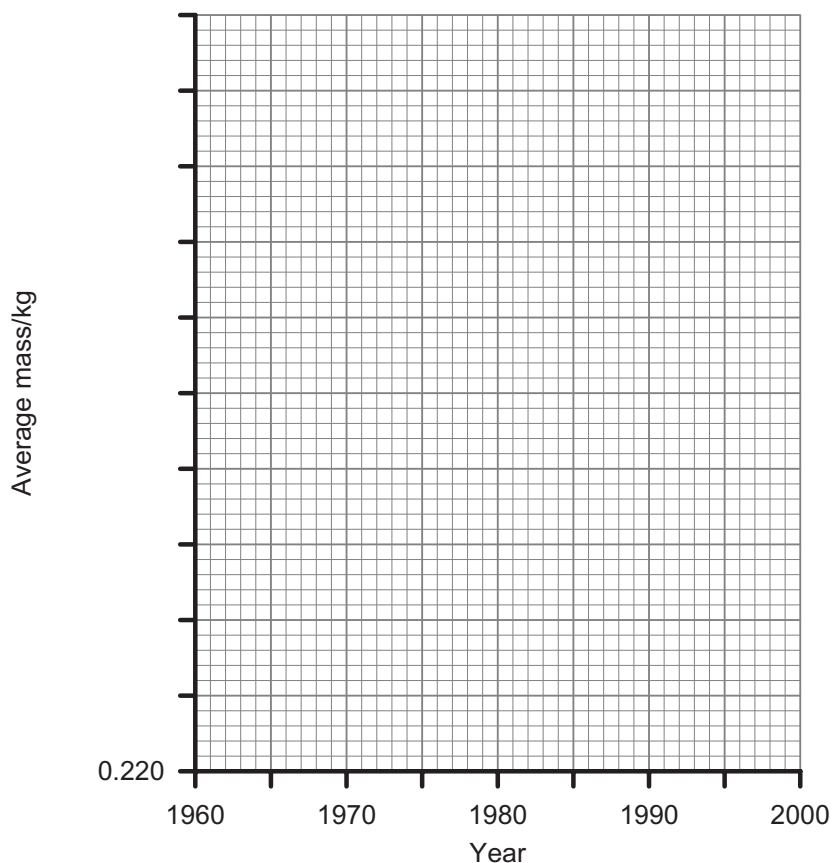
Examiner Only

Marks Remark

- (b) Carrots have undergone selection in a similar process to wheat. The table below shows how the average mass of one type of carrot has changed between 1960 and 2000.

Year	Average mass/kg
1960	0.220
1970	0.245
1980	0.250
1990	0.280
2000	0.320

- (i) Plot this data as a line graph on the axes below.
(You need to complete the scaling for average mass.)



[4]

As well as becoming heavier the carrots have become more evenly-sized.

- (ii) Suggest **one** advantage of this to the farmer.

_____ [1]

Examiner Only	
Marks	Remark

6 Describe and explain the processes involved in drug testing before drugs are licensed for use.

[4]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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