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Examiner's Initials	
Section	Mark
Task 1	
Task 2	
Section A	
Section B	
TOTAL EMPA MARK	



General Certificate of Education
Advanced Subsidiary Examination
June 2013

Human Biology

HBI3X

Unit 3X AS Externally Marked Practical Assignment Written Test

For submission by 15 May 2013

For this paper you must have: • your Task Sheet 2, your results and your calculations • a ruler with millimetre measurements • a calculator.	Time allowed • 1 hour 15 minutes
Instructions • Use black ink or black ball-point pen. • Fill in the boxes at the top of this page. • Answer all questions. • You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages. • Do all rough work in this book. Cross through any work you do not want to be marked.	Information • The marks for questions are shown in brackets. • The maximum mark for this paper is 30. • You are expected to use a calculator where appropriate. • You will be marked on your ability to: – use good English – organise information clearly – use scientific terminology accurately.

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Yes ☐ No ☐

Teacher Declaration:

I confirm that the candidate has met the requirements of the practical skills verification (PSV) in accordance with the instructions and criteria in section 3.8 of the specification.

Practical Skills Verification	Yes ☐
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Section A

These questions relate to your investigation into the concentration of vitamin C in fruit juices.

Use your Task Sheet 2, your results and your graph to answer the questions.

Answer **all** questions in the spaces provided.

- 10** You could not use the method you used in Task 2 to find vitamin C concentration of all fruit juices.
Suggest **one** juice for which you could not use this method and explain why.

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(2 marks)

- 11 (a)** A group of students carefully carried out exactly the same investigation as you. There was a lot of variation between their results. Suggest **two** reasons why.

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2

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(2 marks)

- 11 (b)** Suggest **one** change they could make in the investigation to reduce the variation in their results.

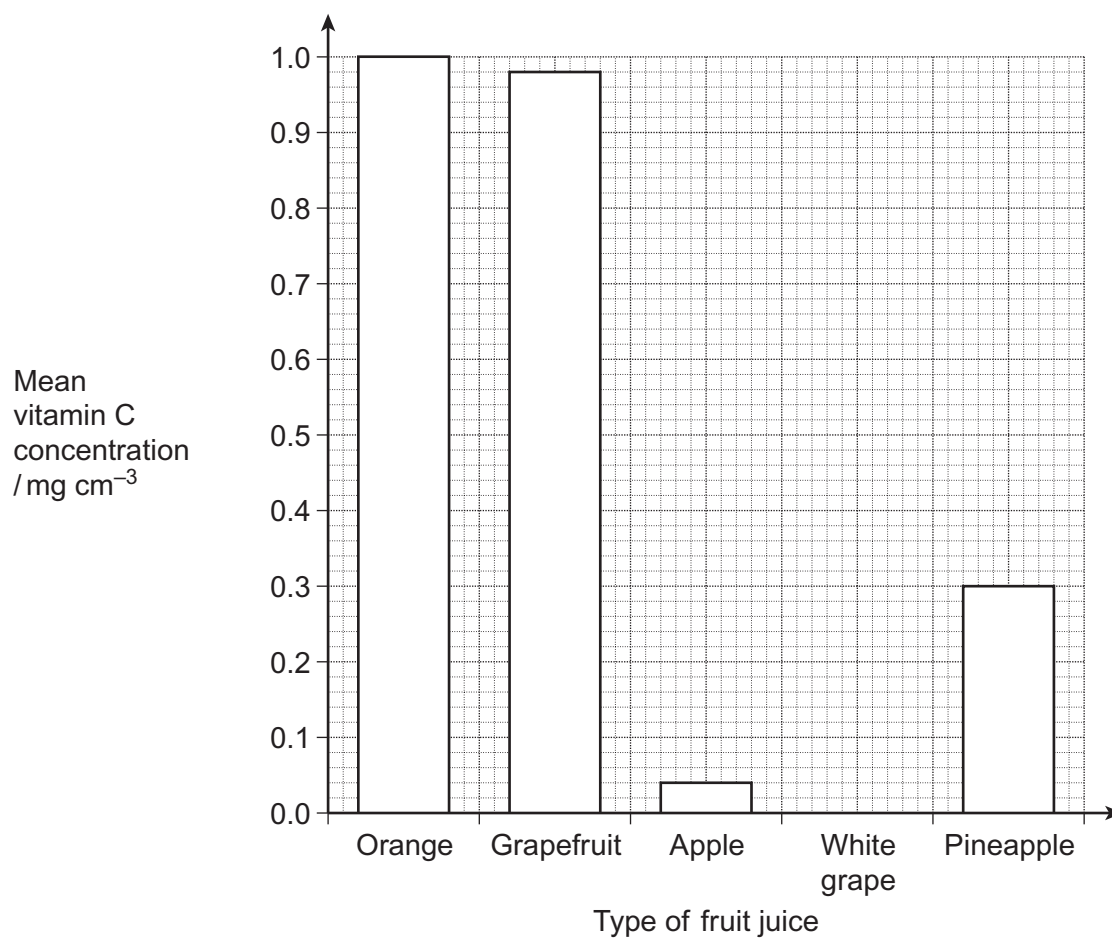
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(1 mark)

- 12** A student carried out a similar investigation to you. He tested five different types of fruit juice. His results are shown below.



- 12 (a)** There is more vitamin C present in grapefruit juice than in pineapple juice. Calculate the percentage difference in grapefruit juice compared with pineapple juice. Show your working.

..... %
(2 marks)

Question 12 continues on the next page

Turn over ►

- 12 (b)** The student used different volumes of juice in each test. He was still able to compare the vitamin C concentration of the fruit juices. Explain why.

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(1 mark)

- 12 (c)** Grapefruit juice has a lower pH than pineapple juice.

- 12 (c) (i)** What could the student have added to the juices to make the pH of the juices the same?

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(1 mark)

- 12 (c) (ii)** pH can affect the glycaemic index of a fruit juice.
Explain what is meant by the term glycaemic index.

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(2 marks)

12 (d) The student concluded that orange juice is better for you than pineapple juice.

12 (d) (i) Explain why he reached this conclusion.

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(1 mark)

12 (d) (ii) Suggest **two** reasons why his conclusion may not be valid.

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2

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(2 marks)

14

Turn over for the next question

Turn over ►

Resource Sheet

Introduction

Vitamin C is found in fruit and vegetables. People who eat a balanced diet do not usually need to take extra vitamin C in tablets.

There are a number of websites which tell cigarette smokers to take vitamin C tablets. The websites suggest that the tablets will reduce the damage to health caused by smoking.

Resource A

Scientists investigated the concentration of vitamin C in the blood of non-smokers and smokers. They recruited 11 592 volunteers and divided them into three groups:

- non-smokers
- people who smoke 1–19 cigarettes per day
- people who smoke 20 or more cigarettes per day.

None of the volunteers took vitamin C tablets.

Cigarettes smoked per day	Mean concentration of vitamin C in blood plasma / mg per 100 cm ³ ± SD
0	1.15 (± 0.02)
1–19	0.97 (± 0.03)
20 or more	0.82 (± 0.02)

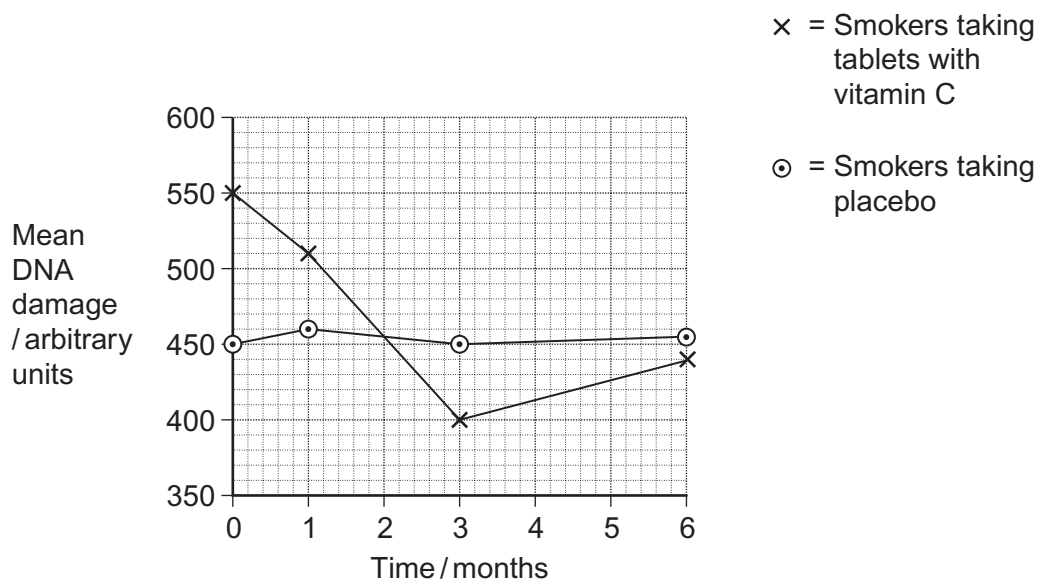
Resource B

Doctors investigated whether vitamin C could reduce damage to DNA caused by substances in tobacco smoke. They recruited smokers who smoked more than 20 cigarettes per day and did not take vitamin C tablets.

The scientists randomly divided the smokers into two groups. They gave one group a vitamin C tablet every day. They gave the other group a placebo tablet every day. During the trial, neither the scientists nor the smokers knew who was being given the placebo tablets. This made it a double-blind trial.

The doctors measured damage to DNA in cells lining the mouths of the smokers.

The results are shown in the graph.



Turn over for Section B

Turn over ►

Section B

Use the information in the **Resource Sheet** to answer the questions.

Answer **all** the questions in the spaces provided.

Use **Resource A** to answer **Questions 13 to 15**.

- 13** In the investigation, each group had the same number of men and women.
Suggest **two** other factors that should have been kept the same.

1

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2

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(2 marks)

- 14 (a)** People who do not get enough vitamin C can get scurvy.
What type of disease is scurvy?

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(1 mark)

- 14 (b)** A student looked at the data in the table and concluded that smoking causes vitamin C
to be broken down by the body. Suggest **one** other explanation.

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(1 mark)

- 15** Do the data in the table show that there is a difference in the vitamin C concentration in the blood plasma of smokers and non-smokers?
Explain your answer.

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(1 mark)

Use **Resource B** to answer **Questions 16 to 18**.

- 16** People in the second group were given a placebo tablet that did not contain vitamin C.

- 16 (a)** Suggest why they were given a placebo.

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(1 mark)

- 16 (b)** The placebo tablets did not contain vitamin C.

Suggest **two** other factors which would be important when making these tablets.

1

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2

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(2 marks)

Turn over ►

17 What is the advantage of using a double-blind trial?

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(1 mark)

18 Describe the differences in DNA damage between the two groups shown in the graph.

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(2 marks)

19 A scientist who saw these results suggested that vitamin C could reduce the risk of smokers developing cancer.
Do these data support this suggestion? Give reasons for your answer.

[illegible]

(Extra space)

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END OF QUESTIONS

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