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Surname						Other Names					
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Candidate Declaration. I have read and understood the Notice to Candidate and can confirm that I have produced the attached work without assistance other than that which is acceptable under the scheme of assessment.											
Candidate Signature						Date					

Teacher's Initials	
Section	Mark
1/18	
2/16	
PSA _{1/6}	
TOTAL (max 40)	



General Certificate of Secondary Education
June 2012

Human Health and Physiology 44152

Unit 2 Investigations in Human Health and Physiology ISA 2 – Lung Capacity

Valid for submission in May 2012

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • results tables and charts or graphs from your own investigation. • a calculator.

Time allowed 45 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 34.
- You are expected to use a calculator where appropriate.
- In some questions you will be marked on your ability to use good English, organise information clearly and use correct scientific words where appropriate.

Details of additional assistance (if any). Did the candidate receive any help or information from anyone other than the subject teacher(s) in the production of this work? If the answer is yes give the details below or on a separate page.

Yes No

Did this candidate take part in the practical activity?	YES / NO
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Teacher Declaration:

I confirm that the candidate's work was conducted under the conditions laid out by the specification. I have authenticated the candidate's work and am satisfied that to the best of my knowledge the work produced is solely that of the candidate.

Signature of teacher Date

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Section 1

These questions are about the investigation that you carried out on lung capacity.

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

1 What was the **independent** variable (the variable that you deliberately changed)?
.....
(1 mark)

2 This question is about the dependent variable in your investigation.

2 (a) What was the **dependent** variable?
.....
(1 mark)

2 (b) Describe briefly how you used the apparatus to measure the **dependent** variable.
.....
.....
.....
.....
.....
(3 marks)

2 (c) Look at your results table and graph or chart.
What range of values did you obtain for the **dependent** variable?
The range was from to
(1 mark)

3 To make the investigation a fair test certain control variables need to be kept the same. There were a number of variables in your investigation which would have been difficult to control.
State **one** variable that you found difficult to control.
.....
(1 mark)



4 What is the best way of processing results?

Put a tick (✓) in the box next to your choice.

Calculate the mean using all the results

Leave out any anomalous result and calculate the mean from the remaining results

Use only the middle value of each set of results

(1 mark)

5 Look at your results table and graph or chart.

5 (a) Describe in detail any patterns you can see in your results.

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

(2 marks)

5 (b) Are you confident that your results are reliable?

Draw a ring around your answer **YES / NO**
Explain your answer.

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

(2 marks)

6 Make sure that **your** results tables, and charts or graphs are handed in with this paper.
You will be awarded up to 6 marks for these. (6 marks)

18

Turn over ▶



Section 2

These questions are based on a vocational application of your own investigation. In some questions you will also be required to relate your own method/results to this new context.

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

Doctors are concerned that smoking may affect the lung capacity of young females. They asked nurses to measure the lung capacity of 520 female **smokers** and 480 female **non-smokers**. The mean for each age group is shown in **Table 1**.

Table 1

Age of females in years	Mean lung capacity for non-smokers in litres	Mean lung capacity for smokers in litres
11	2.00	1.84
13	2.20	2.04
15	2.76	2.24
17	3.10	2.40
19	3.10	2.60
21	3.10	2.64

- 7 (a)** Look at the first column in **Table 1** headed '**Age of females in years**'. What interval did the doctors choose for this variable?

.....years

(1 mark)

- 7 (b)** The doctors chose age and whether the female smoked as independent variables in the investigation. Give **one** variable that the doctors should have controlled.

.....

Explain why this variable should have been controlled.

.....

.....

(2 marks)



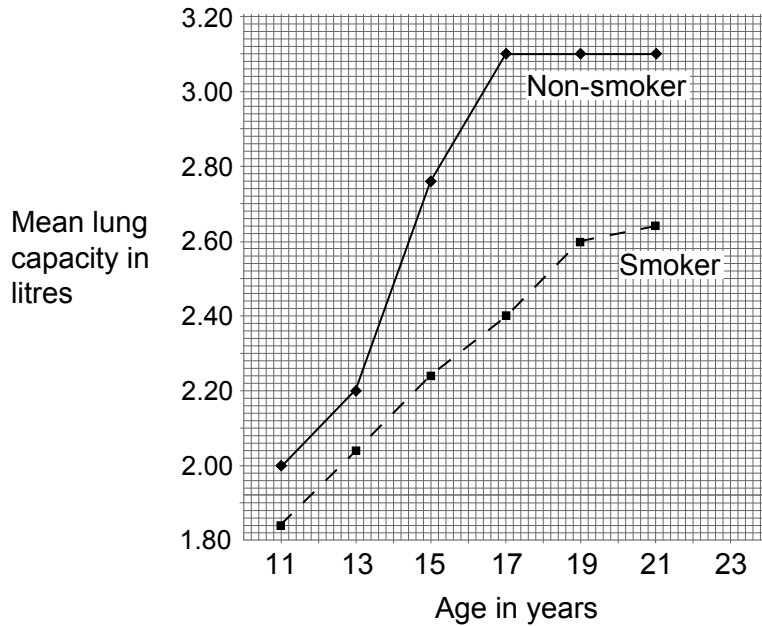
8 In your investigation you recorded all your results in a table.
The doctors recorded only the mean results in their table.
Why is it important to show all the results and not just the mean?

.....
.....

(1 mark)

9 **Graph 1** shows the results from **Table 1**.

Graph 1



Look carefully at **Graph 1**.

9 (a) Predict the mean lung capacity for a 23-year-old **non-smoker**.

..... litres

(1 mark)

9 (b) Give **one** similarity between the lung capacities of non-smokers and smokers.

.....
.....

(1 mark)

9 (c) Give **two** differences between the lung capacities of non-smokers and smokers.

1

.....

2

.....

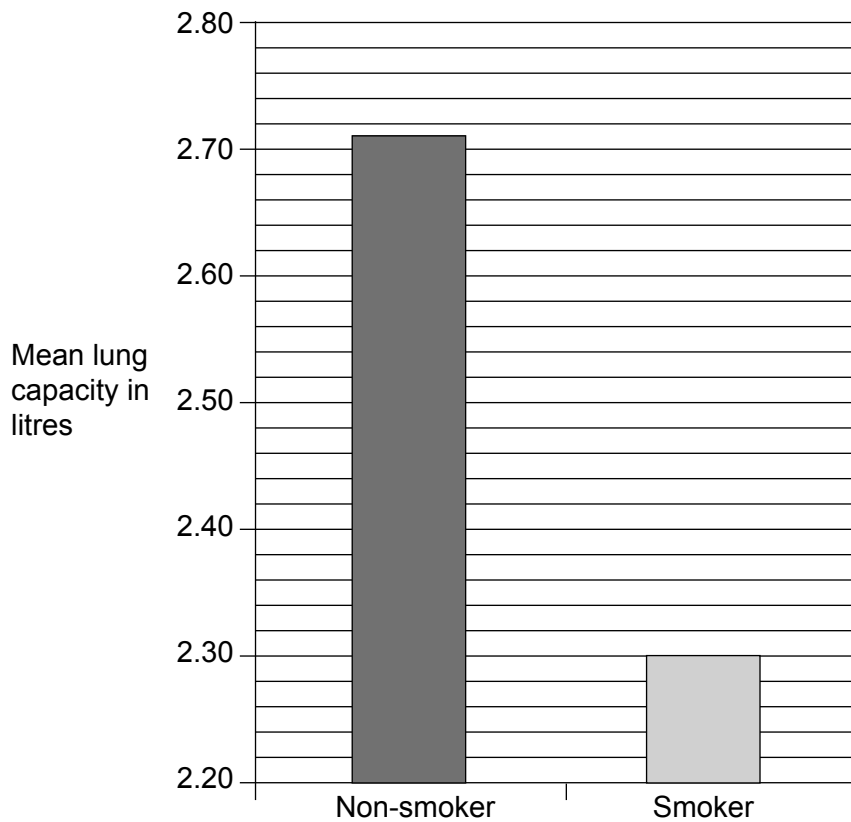
(2 marks)

Turn over ▶



- 10** The doctors calculated the mean lung capacities of all non-smokers and smokers in the investigation. **Chart 1** shows their results.

Chart 1



- 10 (a)** What is the difference between the mean lung capacity of a non-smoker and that of a smoker?

Difference litres

(1 mark)

- 10 (b)** Use the value from **10 (a)** to calculate the approximate percentage reduction in lung capacity of a smoker compared to a non-smoker. Put a tick (✓) in the box next to your choice.

5%

25%

15%

35%

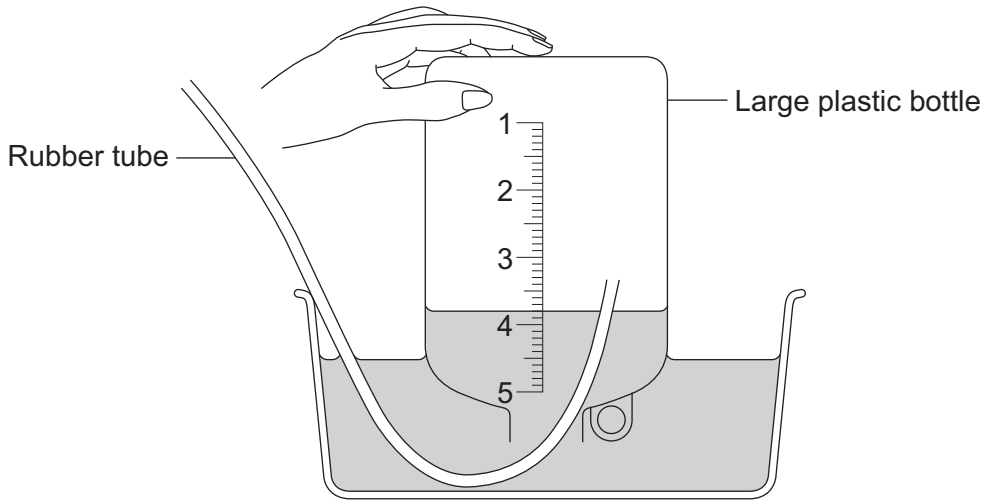
(1 mark)



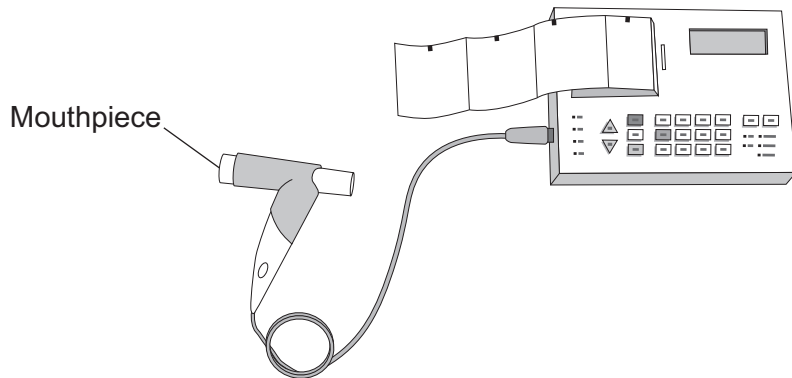
11

A **hospital spirometer** was used by the nurses to record the lung capacities shown in **Table 1**. Below are shown a laboratory spirometer and a hospital spirometer.

Laboratory spirometer



Hospital spirometer



Suggest **two** reasons why the doctors chose to use the hospital spirometer rather than the laboratory spirometer.

Use ideas from your own investigation in your answer.

1

.....

2

.....

(2 marks)

Turn over ▶



12 Use ideas from your own investigation and your knowledge of experimental design to answer this question.

It is claimed that if 13 – 15 year old females give up smoking their lung capacity will be the same as a non-smoker within one year.
Describe how doctors could carry out an investigation to test this claim.

In this question you will be assessed on your ability to use good English, organise information clearly and use correct scientific words.

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(4 marks)

16

END OF QUESTIONS

