

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

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General Certificate of Secondary Education
Specimen Paper

Human Health & Physiology 44152

Unit 2 Investigations in Human Health & Physiology
Specimen ISA Paper
Pulse Rate

For Teacher's Use	
Section	Mark
1	
2	
Total (max 34)	

To be conducted before May 5 xxxx
Valid for submission in May xxxx

For this paper you must have:

- results tables and charts or graphs from your own investigation.

You may use 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 space provided. Answers written in margins or on blank pages will not be marked.
- 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 assessed on using good English, organising information clearly and using specialist terms where appropriate.

Did this candidate take part in the practical activity?	YES / NO
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Signature of teacher marking this ISA Date

The specimen assessment materials are provided to give centres a reasonable idea of the general shape and character of the planned question papers and mark schemes in advance of the first operational exams.

SECTION 1

These questions are about the investigation that you did on how exercise affects the resting pulse rate.

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

1 In your investigation:

1 (a) what was the **independent** variable (the one that you deliberately changed)

.....
.....

(1 mark)

1 (b) what was the **dependent** variable?

.....
.....

(1 mark)

2 Before you did your investigation, you may have done a preliminary trial.
Why is it a good idea to do a preliminary trial?

.....
.....

(1 mark)

3 Why was it important to record the resting pulse rate before exercising?

.....
.....

(1 mark)

4 Control variables need to be kept the same throughout the experiment.

Some of the control variables in your investigation you would have been able to keep the same; others you would not have been able to keep the same.

4 (a) State **one** variable that you were able to keep the same.

.....

(1 mark)

4 (b) State **one** variable that you were **not** able to keep the same.

.....

(1 mark)



Barcode

5 Look at your results table and graph or chart.

5 (a) What conclusion can you make from your investigation about a link between exercise and the time taken for the pulse rate to return to its normal resting rate?

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(2 marks)

5 (b) Use your results to justify the conclusion that you have reached.

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(2 marks)

6 A fitness consultant wants to carry out the same investigation.

Suggest and explain **one** way in which they could improve the reliability of the data obtained in this investigation.

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.....
.....

(2 marks)

7 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)

Turn over for the next section



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.

A hiker wanted to improve his fitness before going on a walking holiday.

He went to a fitness consultant who arranged a fitness programme for him.

The fitness consultant measured the hiker's resting pulse rate at four-hourly intervals, and then measured the pulse rate during exercise.

8 The measurements recorded before and after the fitness programme are shown in the table.

	Time of day	Mean pulse rate in beats per minute
Before fitness programme	8 am – resting	78
	12 noon – resting	92
	4 pm – resting	85
	8 pm – during exercise	158
After fitness programme	8 am – resting	58
	12 noon – resting	72
	4 pm – resting	68
	8 pm – during exercise	130

8 (a) What was the range of mean **resting** pulse rates for the hiker?

The range was from.....to.....beats per minute.
(1 mark)

8 (b) Describe fully the relationship between the time of day and mean **resting** pulse rate.

.....

.....

.....

.....

(2 marks)



Barcode

8 (c) In your own investigation you were required to carry out several repeats and then calculate a mean.

8 (c) (i) Explain how you calculated a mean from the repeat values.

.....
.....
(1 mark)

8 (c) (ii) Why is this better than only recording the pulse rate once?

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.....
(1 mark)

9 Using ideas from your own investigation *and your scientific knowledge* explain in detail how the fitness consultant would take the pulse rate of the hiker using only a stopwatch.

In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

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(4 marks)

10 The hiker sat in the same position each time in order for the pulse rate to be taken by the fitness consultant.

Use ideas from your own investigation to suggest why this was important.

.....
.....
(1 mark)



- 11** The fitness consultant wanted to find out if a fitness campaign could reduce the likelihood of developing coronary heart disease in the future.

The fitness consultant worked with local doctors to identify volunteers for the trial.

The doctors were asked to select patients who:

- were smokers, or
- were overweight, or
- had an above normal blood pressure.

The volunteers were divided into two groups.

Group 1 – The exercise group

This group was given the opportunity to exercise for 10 weeks at a leisure centre, where they took part in moderate and vigorous aerobic exercises.

Group 2 – The non-exercise group

This group was also regularly monitored by the fitness consultant, but did not take part in the exercise programme offered to **Group 1**.

- 11** (a) Why was **Group 2** included in this programme?

.....

(1 mark)

- 11** (b) Which of the following would have been the best way for the doctors to divide the patients into two groups?

Tick (✓) the box next to the correct answer.

Put all the smokers into the same group.

Put all the overweight patients into **Group 1**.

Put all the high blood pressure patients into **Group 2**.

Put all the patients into the two groups randomly.

(1 mark)

- 11** (c) The fitness consultant gathered information about fat reduction and blood pressure from **Group 1** and **Group 2** after the fitness regime.

The results are shown in the table.

Group	% fat reduction	% reduction in blood pressure
1 (with exercise programme)	11.2	7.5
2 (no exercise programme)	2.0	0.5



Barcode

- 11 (c) The hiker was included in **Group 1**.
To help you with this question, the table of his results is reprinted here.

	Time of day	Mean pulse rate in beats per minute
Before fitness programme	8 am – resting	78
	12 noon – resting	92
	4 pm – resting	85
	8 pm – during exercise	158
After fitness programme	8 am – resting	58
	12 noon – resting	72
	4 pm – resting	68
	8 pm – during exercise	130

Using **all** these results, **and** the results of your own investigation, what conclusion can you make about the benefits of exercise in an extended fitness campaign?

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(3 marks)

- 11 (d) Suggest **one** reason why some health workers may object to this type of investigation.

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(1 mark)

END OF QUESTIONS

