Surname					Other Names						
Centre Number						Candidate Number					
Title of your own investigation if different											
Are the results and tables presented with this work your own?								YES / NO			
Candidate Signature						Date					

Leave blank

General Certificate of Secondary Education
June 2007 / June 2008

SCIENCE / BIOLOGY **SCYC/BLYC/B1.2**
ISA B1.2 Reaction Times

To be conducted between 1 September 2006 and 4 May 2008
For submission in May 2007 or May 2008

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

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 blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in **Section 1** and **Section 2**.
- Answer the questions in the spaces provided.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The maximum mark for this paper is 34.
- The marks for questions are shown in brackets.
- You are reminded of the need for good English and clear presentation in your answers.

Signature of teacher marking this ISA ..... Date .....

LEAVE MARGIN BLANK

SECTION 1

These questions are about the investigation that you carried out on reaction times.

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

1 What were you trying to find out in your investigation?

.....

.....

.....

.....

(2 marks)

2 In your investigation:

(a) state **one** variable that it was important to keep the same;

.....

(1 mark)

(b) say how you kept this variable the same;

.....

.....

(1 mark)

(c) explain why it was important to keep this variable the same.

.....

.....

(1 mark)

3 Now look at a results table. Your teacher will tell you which results table to use. Put a tick (✓) in the box next to the results table that you are using.

Own results ☐ Group results ☐ Class results ☐

(a) What **range** of values was used for the **independent** variable?

The range was from ..... to .....

(1 mark)

(b) How would you check the **reliability** of your results?

.....

.....

(1 mark)

(c) Do you think that your results show **precision**?

Draw a ring around your answer. **Yes / No**

Explain the reason for your answer.

.....

.....

(1 mark)

4 What did you find out in your investigation?

.....

.....

.....

.....

(2 marks)

5 Are you confident about what you have found out?

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

SECTION 2

These questions are about an investigation that may be similar to the one you carried out.

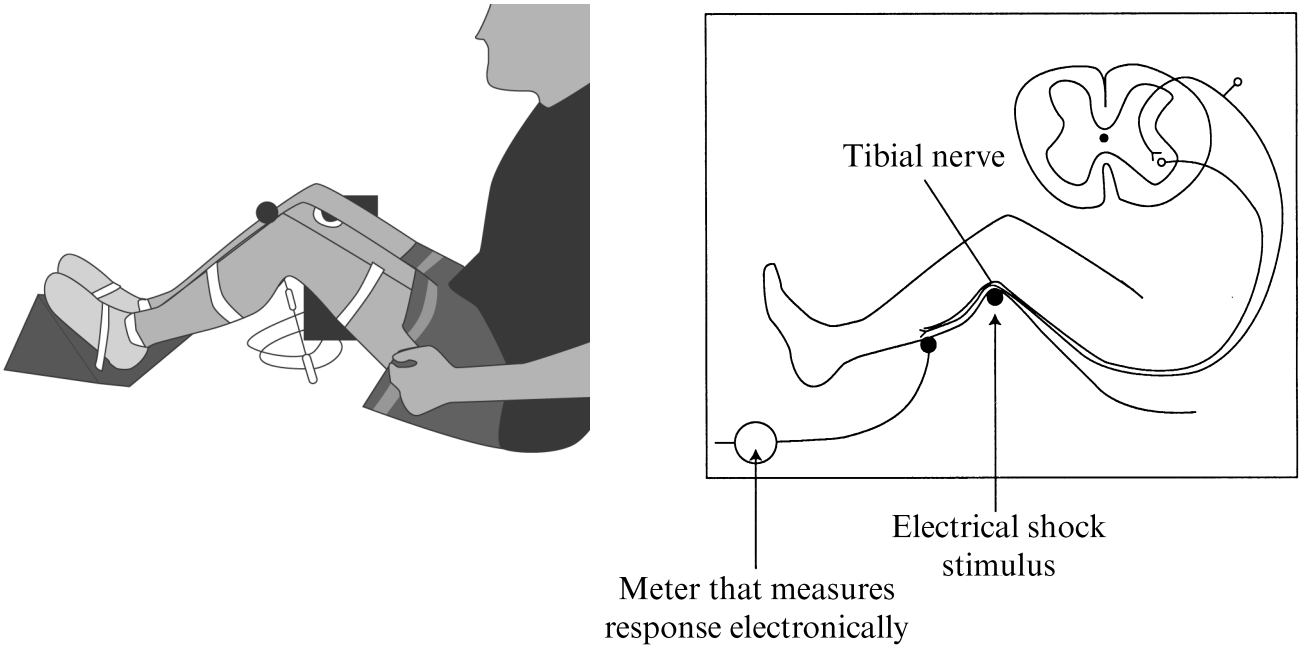
Answer **all** questions in the spaces provided.

Researchers use the Hoffmann technique to measure reflexes. They give an electrical shock stimulus to a nerve at the back of the knee.

They use an electrical recorder to measure the response of the muscle.

The stimulus is then slowly increased and the strength of the response is recorded.

Look at the diagram to see how the equipment is set up.



The table gives the results of tests on two different people.

Strength of stimulus in arbitrary units	**Strength of response**	
	Person **A**	Person **B**
1.4	1.7	1.4
2.1	3.6	3.3
2.6	3.8	3.4
3.0	3.7	3.5
3.4	3.5	3.4

7 Look at the results table.

(a) What piece of information is missing from the table?

.....

(1 mark)

(b) What was the smallest scale division of the meter that measured the strength of the response?

.....

(1 mark)

(c) Complete the sentence by choosing the correct word from the box.

accurate	**precise**	**reliable**	**valid**

The researchers could have used a meter with a smaller scale division.

This would have made the results more.....

(1 mark)

8 Describe fully the effect of increasing the strength of the stimulus on the response of Person **A**.

.....

.....

.....

.....

.....

.....

(3 marks)

9 Give **two** ways in which the responses of Person **B** were different from the responses of Person **A**.

1 .....

.....

2 .....

.....

(2 marks)

10 When using the Hoffmann technique, the people being tested must have their legs bent at 45° and hold their arms by their sides. They must also have their eyes closed.

(a) Why is it important that all the people being tested are in the same position for the test?

.....

.....

(1 mark)

(b) Suggest why it is also important that the people being tested have their eyes closed.

.....

.....

(1 mark)

11 Scientists have found that astronauts have difficulty balancing when they return to Earth after a long period in space. The scientists think that this might be due to a change in the strength of response of their reflex actions. Astronauts visiting the Space Station for 10 weeks were used to test this idea.

(a) Describe how the Hoffman technique could be used to test this idea.

To gain full marks in this question you should write your ideas in good English. Put them into a sensible order and use the correct scientific words.

.....

.....

.....

.....

.....

.....

.....

.....

(4 marks)

(b) Astronauts want to visit other planets. This will take many years of travel in weightless conditions. The results of the investigation will help scientists to develop a programme of exercises for the astronauts.

Suggest **two** reasons why this is important for the safety of the astronauts.

1 .....

.....

2 .....

.....

(2 marks)

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END OF QUESTIONS

There are no questions printed on this page