

Centre Number						Candidate Number				
Surname										
Other Names										
Candidate Signature										

For Teacher's Use	
	Mark
Stage 1 Skills	
Stage 2 Skills	
Section A	
Section B	
TOTAL ISA Mark	



General Certificate of Education
Advanced Subsidiary Examination
June 2010

Biology

BIO3T/Q10/test

Unit 3T AS Investigative Skills Assignment

Written Test

For submission by 15 May 2010

For this paper you must have:

- your Task Sheet including your results and your graph
- 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 35.
- You will be marked on your ability to
 - use good English
 - organise information clearly
 - use accurate scientific terminology.

Signature of Teacher marking the ISA Date

Section A

These questions relate to your investigation into the effect of alcohol concentration on the leakage of pigment from beetroot cells.

Use your Task Sheet, your results table and graph to answer them.

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

- 1** You were provided with beetroot discs that were washed thoroughly before the start of the investigation. Explain why it was important to wash the beetroot discs.

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(1 mark)

- 2** In **Part 2** of this investigation you used five concentrations of alcohol.

- 2 (a)** Describe a suitable control for your investigation.

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(1 mark)

- 2 (b)** Explain why this control would be necessary.

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(1 mark)

- 3 (a)** Explain why you were instructed to shake the test tubes every minute (step 11).

.....
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(1 mark)

- 3 (b)** Explain why you were instructed to pour the alcohol *immediately* from the experimental test tube into a clean test tube (step 12).

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(1 mark)

4 You were given discs taken from fresh beetroot in your investigation. Explain why your results would have been different if you had used cooked beetroot.

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(2 marks)

5 You used a water bath in this investigation. Explain why a decrease in temperature of 5 °C would affect the results.

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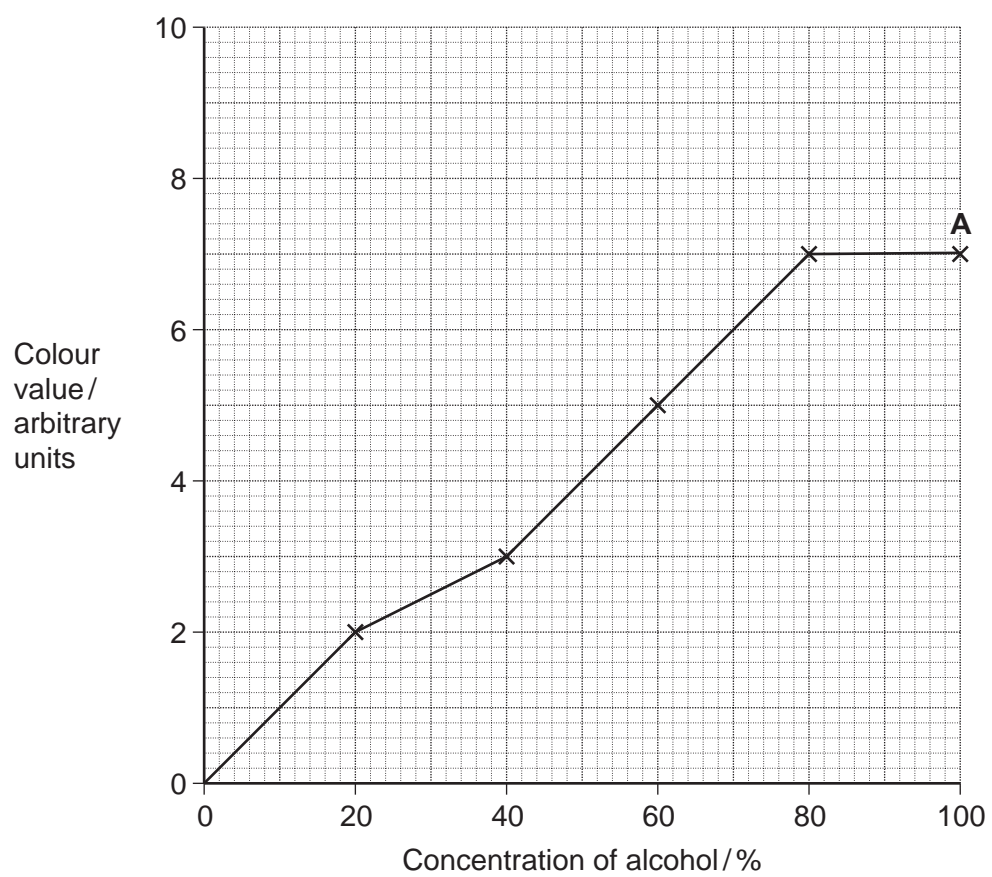
(2 marks)

6 Two students carried out the same investigation as you did. They worked in the same practical session and followed the same procedure. They worked accurately but found their results were different. Suggest **one** reason for this.

.....
.....

(1 mark)

7 A student carried out the same investigation as you did using the same concentrations of alcohol. He used his data to plot the following graph.



7 (a) The student started drawing his curve from the origin, was he correct to do this? Explain why.

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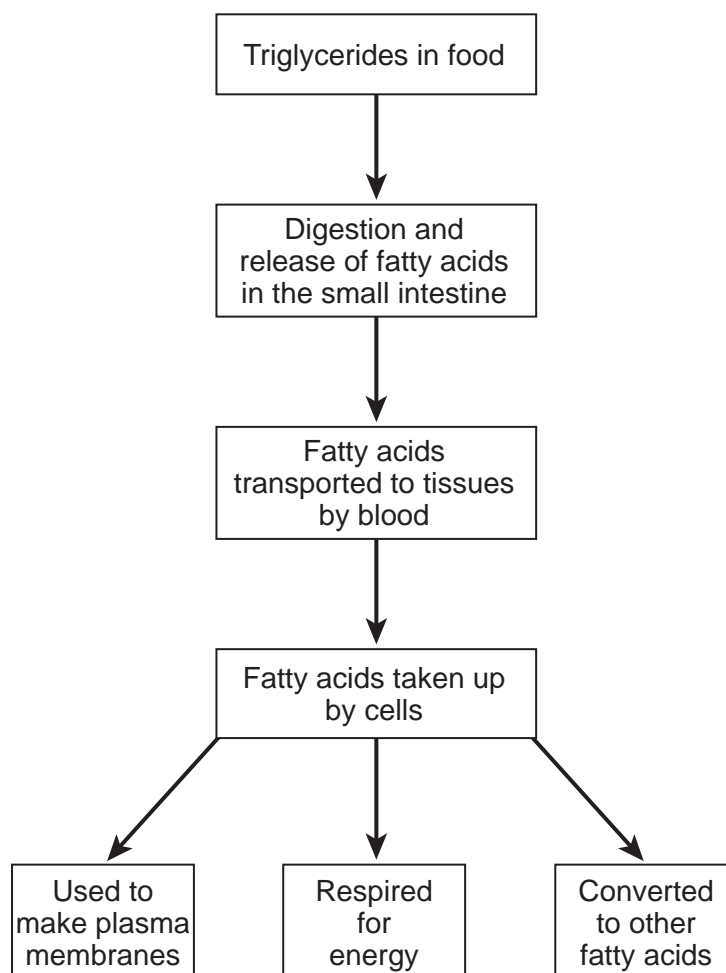
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(1 mark)

RESOURCE SHEET**Resource A**

Triglycerides are taken into the body as part of a balanced diet. These triglycerides contain fatty acids including omega-3 fatty acids. It has been discovered that omega-3 fatty acids are associated with health benefits. The benefits include faster development of nerve cells and clearer vision. Omega-3 fatty acids are also associated with protection from heart disease, arthritis and cancer.

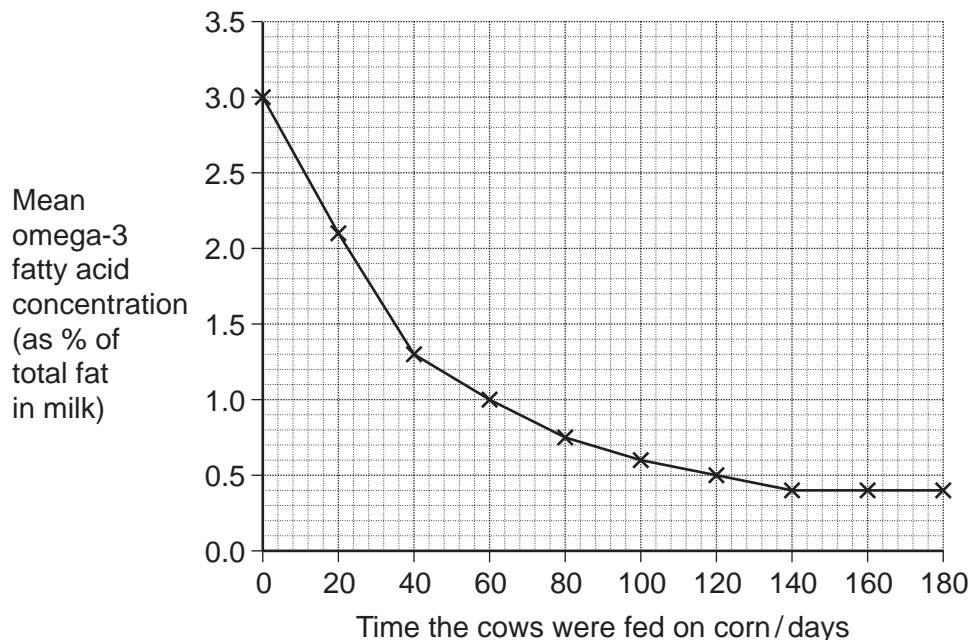
Figure 1 shows how omega-3 and other fatty acids are taken in and used by the bodies of animals including humans.

Figure 1

Resource B

Omega-3 fatty acids are found in cows' milk. Scientists investigated changes in the concentration of omega-3 fatty acids in milk when cows were moved from eating grass in fields to eating corn in cattle sheds. **Figure 2** shows the results of one investigation.

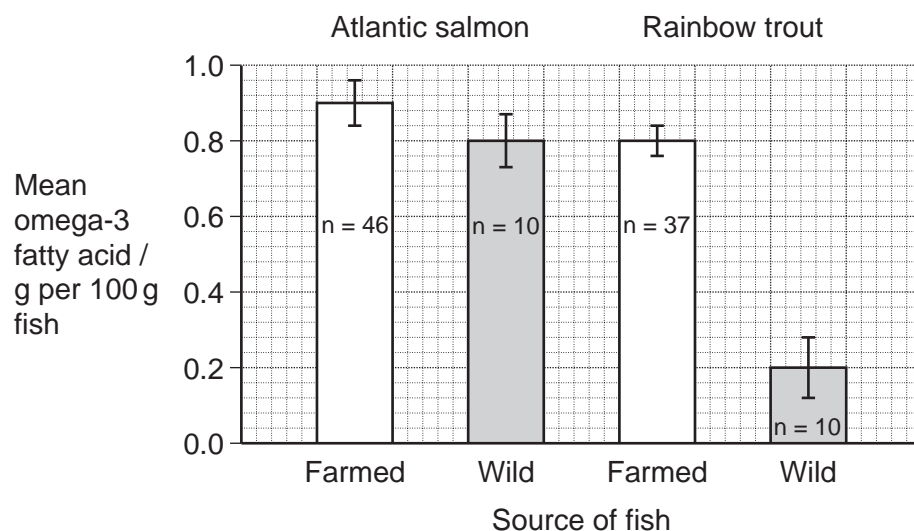
Figure 2



Resource C

Omega-3 fatty acids are also found in fish. Scientists investigated the concentration of omega-3 fatty acids from wild-caught and farmed fish. Their results are shown in **Figure 3**.

Figure 3



The bars show standard deviation; n is the sample size.

Turn over ►

Section B

Use the information in the **Resource Sheet** on triglycerides and omega-3 fatty acids to answer the questions.

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

Use information from **Resource A** and your own knowledge to answer Question 9.

9 Use the information in **Figure 1** to explain **two** ways in which fatty acids are important in the formation of new cells.

- 1.
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- 2.
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(4 marks)

Use **Resource B** to answer Questions 10 and 11.

10 The concentration of omega-3 fatty acids in milk changed when cows were fed on corn instead of grass. Describe how.

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(2 marks)

11 (a) Calculate the rate of decrease in the mean omega-3 fatty acid concentration between 0 and 40 days.
Show your working.

Answer.....% per day
(2 marks)

11 (b) The omega-3 fatty acid concentration is expressed as a percentage of total fat.
Explain the advantage of this.

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(2 marks)

11 (c) One farmer concluded from the graph that feeding cows on corn reduces the omega-3 fatty acid content in milk. Evaluate this conclusion.

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(4 marks)

Extra space

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Use **Resource C** to answer this question.

12 It is **not** possible to conclude from the data that the concentration of omega-3 fatty acids in the farmed salmon is higher than that of the wild salmon. Use the data to explain why.

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(2 marks)

Use **Resource A** and **Resource C** to answer this question.

13 There is a difference between the concentration of omega-3 fatty acids in the wild trout and trout farmed in cages. Suggest **two** causes of this difference.

1.
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2.
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(2 marks)

18

END OF QUESTIONS