

Surname	Centre Number	Candidate Number
Other Names		0



GCSE

0682/01

ADDITIONAL APPLIED SCIENCE

Unit 2: Science at Work in Applied Contexts

FOUNDATION TIER

A.M. TUESDAY, 24 January 2012

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	7	
2.	6	
3.	9	
4.	10	
5.	4	
6.	8	
7.	4	
Total	48	

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ADDITIONAL MATERIALS

In addition to this examination paper, you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets at the end of each question or part-question.

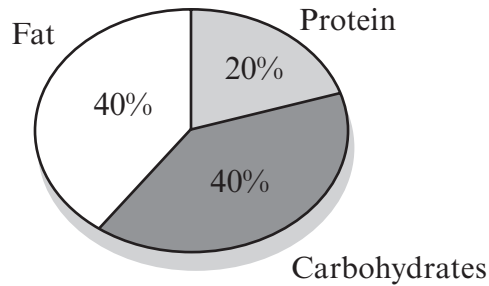
You are reminded of the necessity for good English and orderly presentation in your answers.

You are reminded to show all your working. Credit is given for correct working even when the final answer given is incorrect.

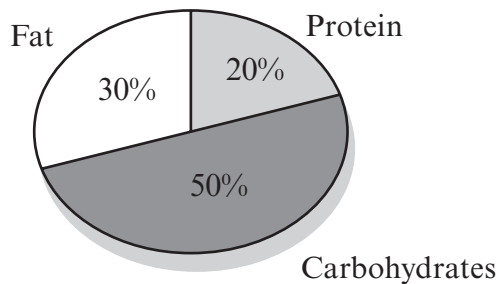
SECTION A (36 marks)

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

1. Pupils in year 10 have been analysing the food content of the school menu. The results are shown below.

First Menu

The pupils suggested a healthy eating menu. The result of the analysis of the new menu is shown below.

Healthy Eating Menu

- (a) Give **two** differences between the food content of the two menus. [2]

1.
2.

- (b) (i) Give **one** reason why the first menu is considered to be unhealthy. [1]

.....

- (ii) State **two long term** health risks that could be caused by the first menu. [2]

1.
2.

- (c) (i) What is the function of protein in a diet? [1]

.....

- (ii) What is the function of carbohydrate in a diet? [1]

.....

2. Over time the design of badminton racquets has changed so top players can improve their performance. Read about how badminton racquets have changed over time.



Badminton racquets are lightweight, with top quality carbon fibre racquets having a mass of 90 g. Earlier racquets were made of wood. Wooden racquets are no longer made because of their larger mass (240 g). Also, unlike wooden racquets, which warped, cracked and dried out with age, carbon fibre racquets can last for many years. Carbon fibre racquets transfer more kinetic energy to the shuttlecock than wooden racquets.

- (a) Use the information above to answer the questions that follow.

- (i) State **three** ways in which carbon fibre racquets are different to wooden racquets. [3]

1.
2.
3.

- (ii) Complete the sentence by underlining the correct word in the brackets. [1]

Carbon fibre reinforced plastic is a (ceramic / polymer / composite)

- (b) Find the density of carbon fibre if the volume of the racquet is 60 cm³, using the following equation: [2]

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Density = g/cm³

3. Bacteria, such as salmonella, can contaminate food.

Staff in a restaurant kitchen are trained to take hygiene precautions when they **store** and **prepare** food.

(a) (i) State **two** precautions they take. [2]

1.

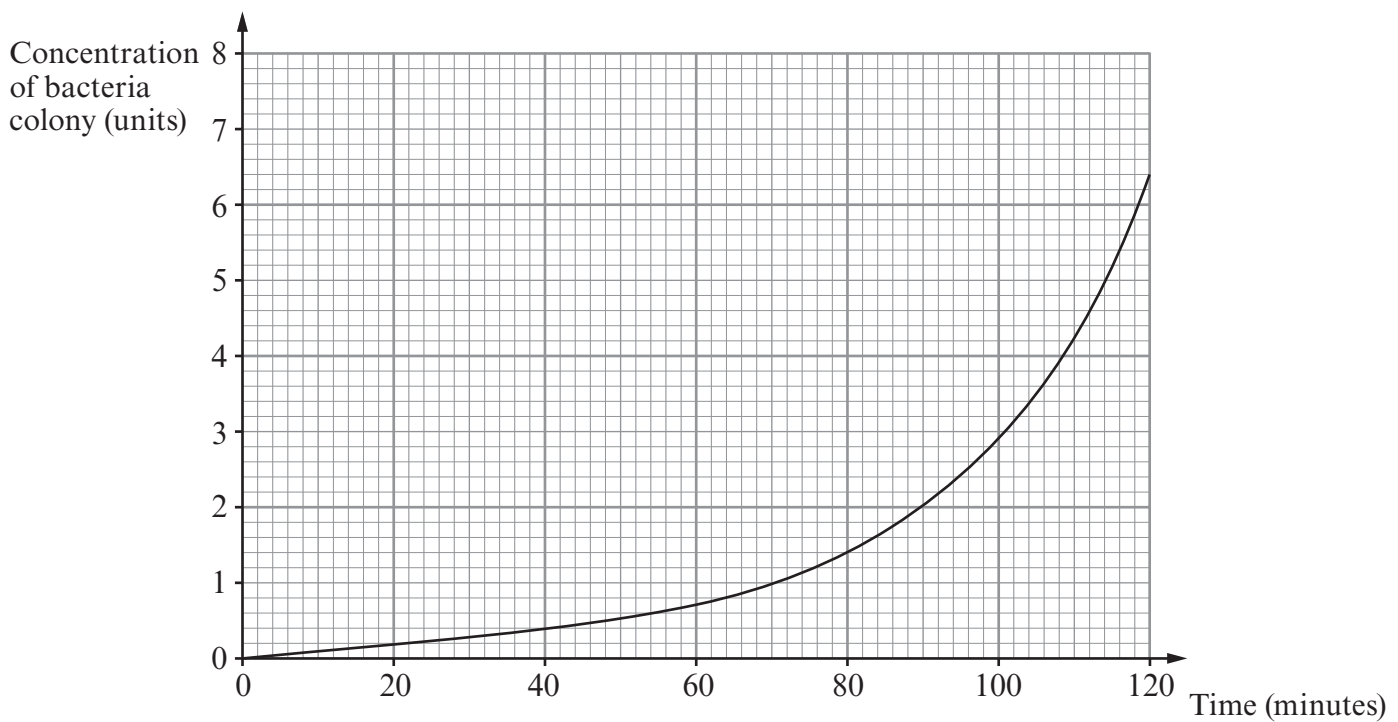
2.

(ii) Name **two** different health problems caused by salmonella. [2]

1.

2.

(b) The graph below shows how the concentration of a bacteria colony in cooked meat changes with time at room temperature.

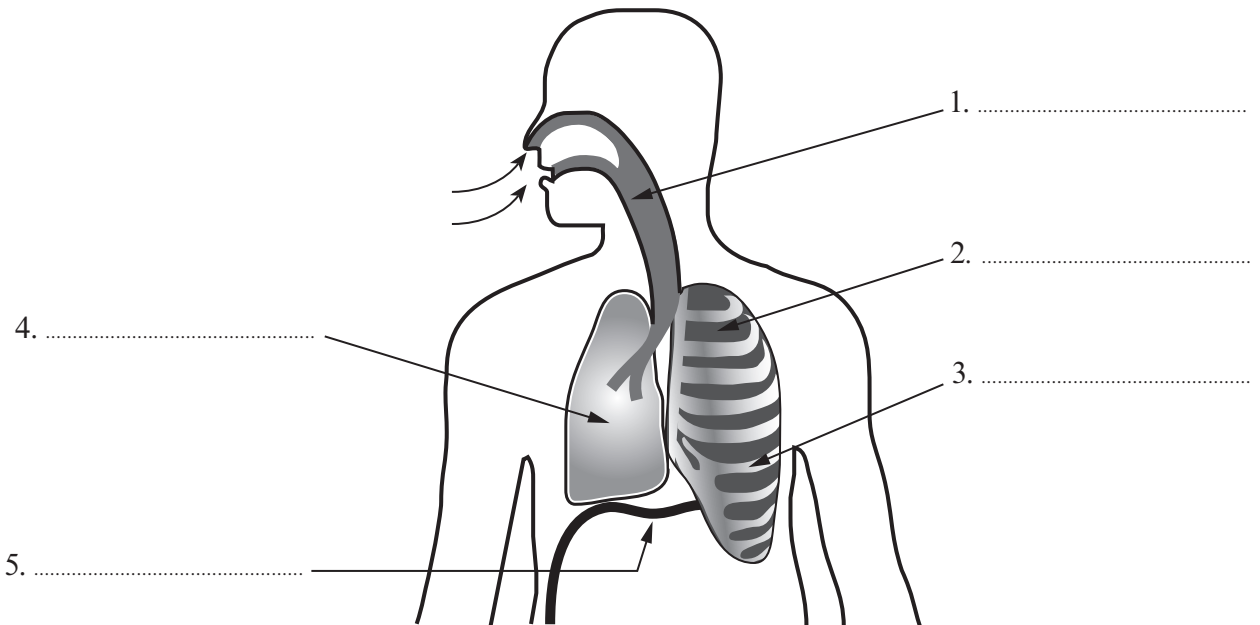


- (i) Use the graph to describe how the concentration of bacteria changes with time. [1]
.....
- (ii) Use the graph to find the concentration of bacteria after 40 minutes. [1]
.....
- (iii) During training, kitchen staff are told how long they can leave food on display before it becomes unsafe to eat. It becomes unsafe to eat once the concentration of bacteria becomes 2 units. [1]
Use the graph to find out how long this takes.
.....
- (iv) Explain why the staff are told they should display the food for less time during the summer. [2]
.....
.....
.....

4. An athlete learns from his fitness instructor that exercise will result in deeper breathing and an increase in the breathing rate.

- (a) (i) The diagram shows the structures in the chest that are involved during breathing. Label the parts indicated using words from the box. [4]

lung	diaphragm	intercostal muscles	trachea (wind pipe)	ribs
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- (ii) Describe what happens to **each** of the structures below when the athlete breathes in. [3]

1. Diaphragm
-
2. Ribcage
-
3. Lungs
-

- (b) During exercise, the athlete will breathe faster and more deeply.

- (i) What is the advantage of an athlete taking deeper breaths? [1]

.....

.....

- (ii) Name the **two** gases exchanged in the lungs. [2]

1.
2.

5. China's food and drug regulator has ordered a ban on eight new food additives due to a health scare.

(i) Give **two** reasons why additives are used to **improve** food. [2]

1.

2.

(ii) Give **two** disadvantages of using food additives. [2]

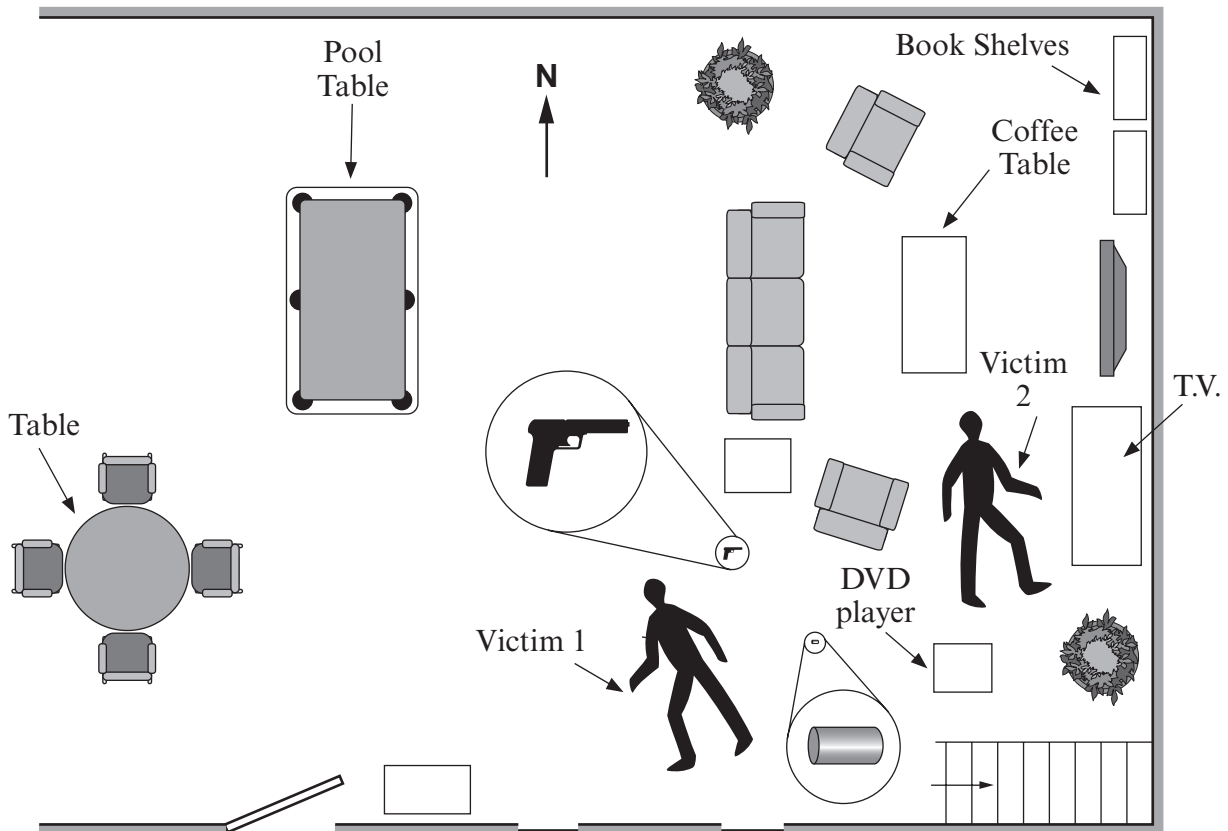
1.

2.

SECTION B (12 marks)

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

6. The diagram below shows a room at a crime scene.



- (a) State **two** ways in which a Scene of Crime Officer (SOCO) protects the crime scene. [2]

1.
2.

(b) A SOCO found these fingerprints at the crime scene.

A



B



C



- (i) State the name of this type of fingerprint pattern. [1]
- (ii) A fingerprint taken from the suspect is shown below.



1. Which fingerprint from the crime scene is a match for the suspect's fingerprint? [1]
.....

2. Add **two** circles to the suspect's fingerprint that helped you make your decision. [2]

- (iii) Explain why only fingerprint evidence cannot prove that the suspect did the crime. [2]

.....

.....

.....

7. A manufacturer of crisps has developed a healthier baked version of ready salted crisps. The labels compare the nutrients in the baked crisps with original crisps.

Original Crisps

Each 25 g bag of Ready Salted contains				
Calories	Fat	Saturates	Fibre	Salt
133	8.5 g	0.7 g	1.0 g	0.4 g

Baked Crisps

	per 100 g	per 25 g
Energy (Calories)	392	98
Protein	6.0 g	1.5 g
Carbohydrates	74 g	18.5 g
of which sugars	6.4 g	1.6 g
Fat	8.0 g	2.0 g
of which saturates	1.2 g	0.3 g
Fibre	5.6 g	1.4 g
Sodium*	0.6 g	0.2 g
*Equivalent as salt	1.5 g	0.4 g

- (a) **Explain** why the manufacturer can claim that baked crisps are healthier. [2]

.....

.....

.....

- (b) The GDA (Guideline Daily Amount) for salt is 2.4 g. Calculate the **percentage** of the GDA of salt provided by the original crisps. [2]

Answer %