

Candidate Name	Centre Number	Candidate Number
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GCSE

682/01

ADDITIONAL APPLIED SCIENCE

Unit 2: Science at Work in Applied

Contexts

FOUNDATION TIER

A.M. THURSDAY, 13 January 2011

45 minutes

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

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.

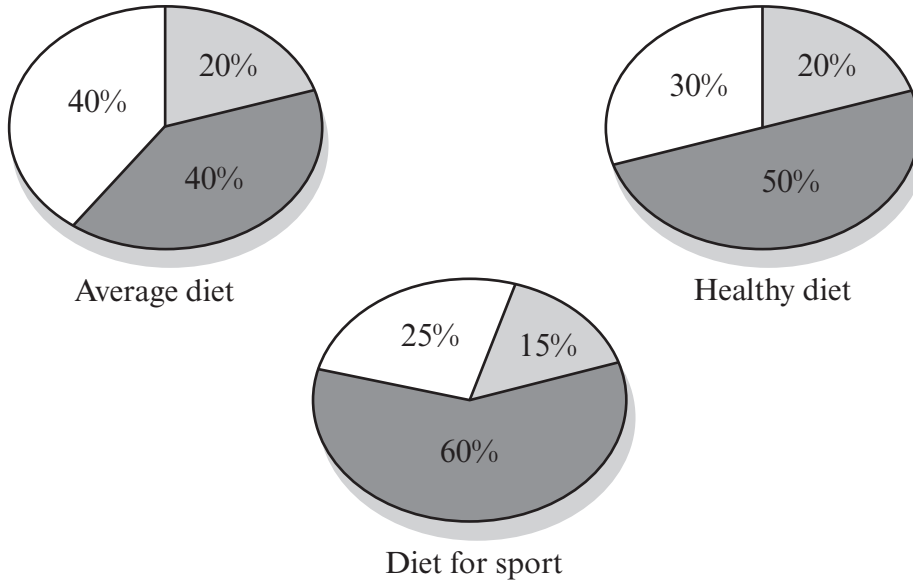
You are reminded of the necessity for good English and orderly presentation in your answers.

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. A dietician analyses three types of diet. Her results are shown below.



Carbohydrate
 Fat
 Protein

- (a) (i) Which diets contain the same percentage of protein? [1]
- (ii) Which diet contains the least fat? [1]
- (b) (i) The dietician is concerned about the **average diet**. Place a tick in the box below next to the food type that she would recommend to reduce in an average diet. [1]
- Fat
- Carbohydrate
- Protein
- (ii) Give **two** health risks caused by the average diet. [2]
1.
2.
- (c) Before a competition, the dietician advises athletes to change to the diet for sport. State **two** differences between the healthy diet and the diet for sport. [2]
1.
2.

2. Additives are sometimes added to food. Some are given E numbers. The table gives information about additives.

E Numbers for Types of Additives

<i>Series</i>	<i>Function</i>	<i>Example</i>
E100	Colours	E160a Carotene
E200	Preservatives	E234 Nisin
E300	Antioxidants	E307 Alpha-tocopherol
E400 +	Miscellaneous	E440 Pectin (stabiliser) E501 Sodium bicarbonate (raising agent)

- (a) (i) Which **series** of additives increases the shelf life of food? [1]
- (ii) Which **series** of additives improves the appearance of food? [1]
- (b) Ammonia caramel has an E number E150c. What is its function? [1]
-
- (c) Sodium nitrate is added to pizza to reduce the growth of bacteria. Circle the correct E number for sodium nitrate from the list below. [1]
- E332 E106 E251 E178

3. A forensic scientist uses flame tests to find out if a certain chemical is present. The flame colour will be different for different chemicals.

<i>Chemical</i>	<i>Symbol</i>	<i>Flame colour</i>
calcium	Ca	red
copper	blue/green
lead	Pb	blue/white
potassium	lilac
.....	Na	orange

(a) **Complete** the table. [3]

(b) All the chemicals shown in the table are metals.
Give **two** properties of metals. [2]

1.

2.

(c) A powder was found at a crime scene. It was dissolved in water and two tests were carried out.

(i) A wire loop was used to carry out a flame test.
The flame was lilac.
Name the metal present in the powder. [1]

(ii) Hydrochloric acid was added to the solution.
A gas was produced. The gas turned limewater milky.
Name the gas that was produced. [1]

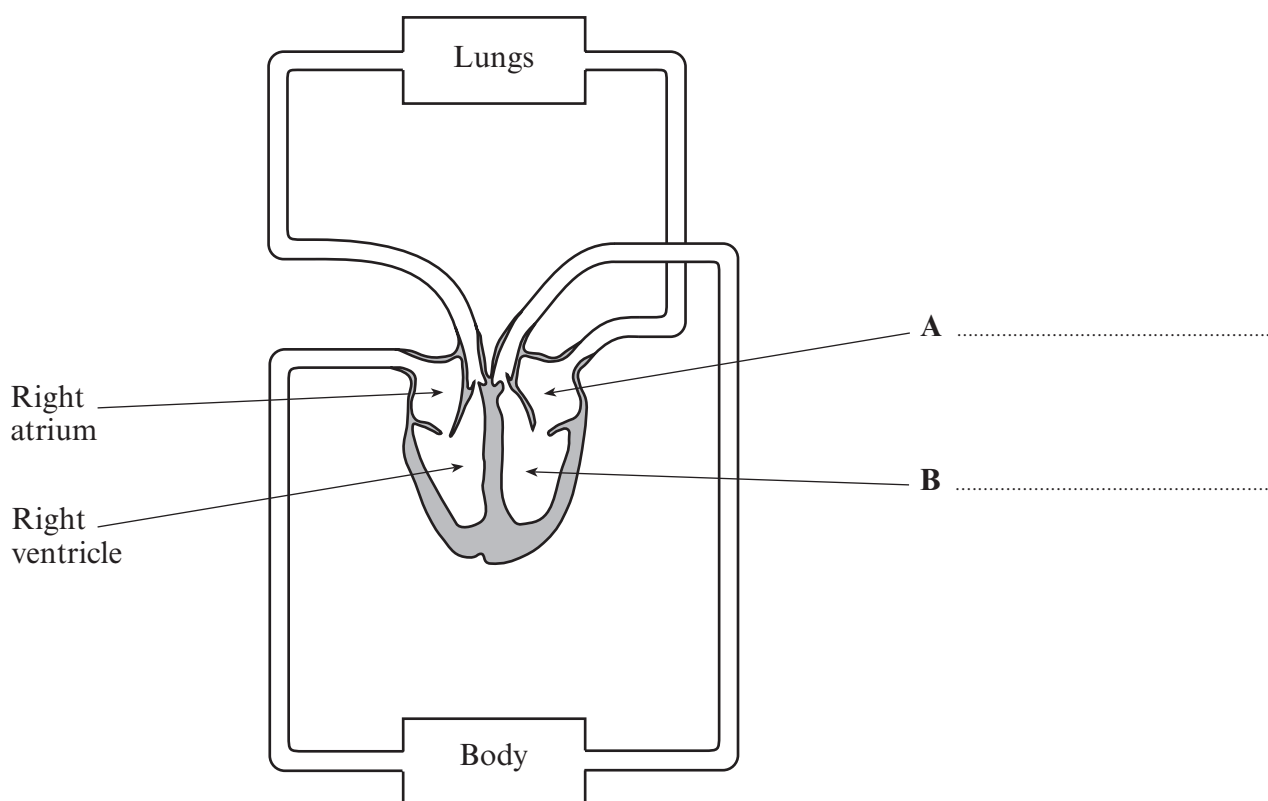
(iii) Use the results to put a tick (✓) in the box next to the powder in the sample. [1]

Metal nitrate

Metal carbonate

Metal chloride

4. The diagram shows the Circulatory System in the human body.



(a) (i) Label the parts **A** and **B** on the diagram. [2]

(ii) Give **one** reason why this is called a double circulatory system. [1]

.....

(b) A technician monitors blood flow around the body.

Use **the labels** on the diagram, to list in order the path the blood takes as it flows from B to A. [3]

B to to

to to to **A**

(c) Blood travels through blood vessels called **veins**, **arteries** and **capillaries**.

(i) **Name** the type of blood vessel that carries blood from the heart to the body. [1]

.....

(ii) **Name** the type of blood vessel that carries blood from the lungs to the heart. [1]

.....

5. Manufacturers use many materials to make sportswear and sports equipment. These include cotton, polyester, Lycra, leather, wood and composites.

(a) (i) From the list, **name** a natural material used to make cricket bats.
 [1]

(ii) From the list, **name** a natural material used to make football shorts.
 [1]

(iii) From the list, **name** a synthetic material used to make sportswear.
 [1]

(b) **State two** advantages to a sprinter if he wears clothing made from Lycra instead of cotton. [2]

(c) The mass of the shot used by women shot putters is 4000 g.
 Modern shots used are made from brass instead of lead.
 The table shows some properties of shot made from lead and brass.

<i>Material</i>	<i>Density (g/cm³)</i>	<i>Volume (cm³)</i>	<i>Hardness (Moh)</i>
Lead	11.3	354	2
Brass	8.7		4

(i) Lead shot had to be measured after every throw to make sure their mass had not changed. Explain why this is not necessary now brass shots are used. [2]

(ii) Use the equation below to find the volume of a brass shot. [2]

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

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SECTION B (12 marks)

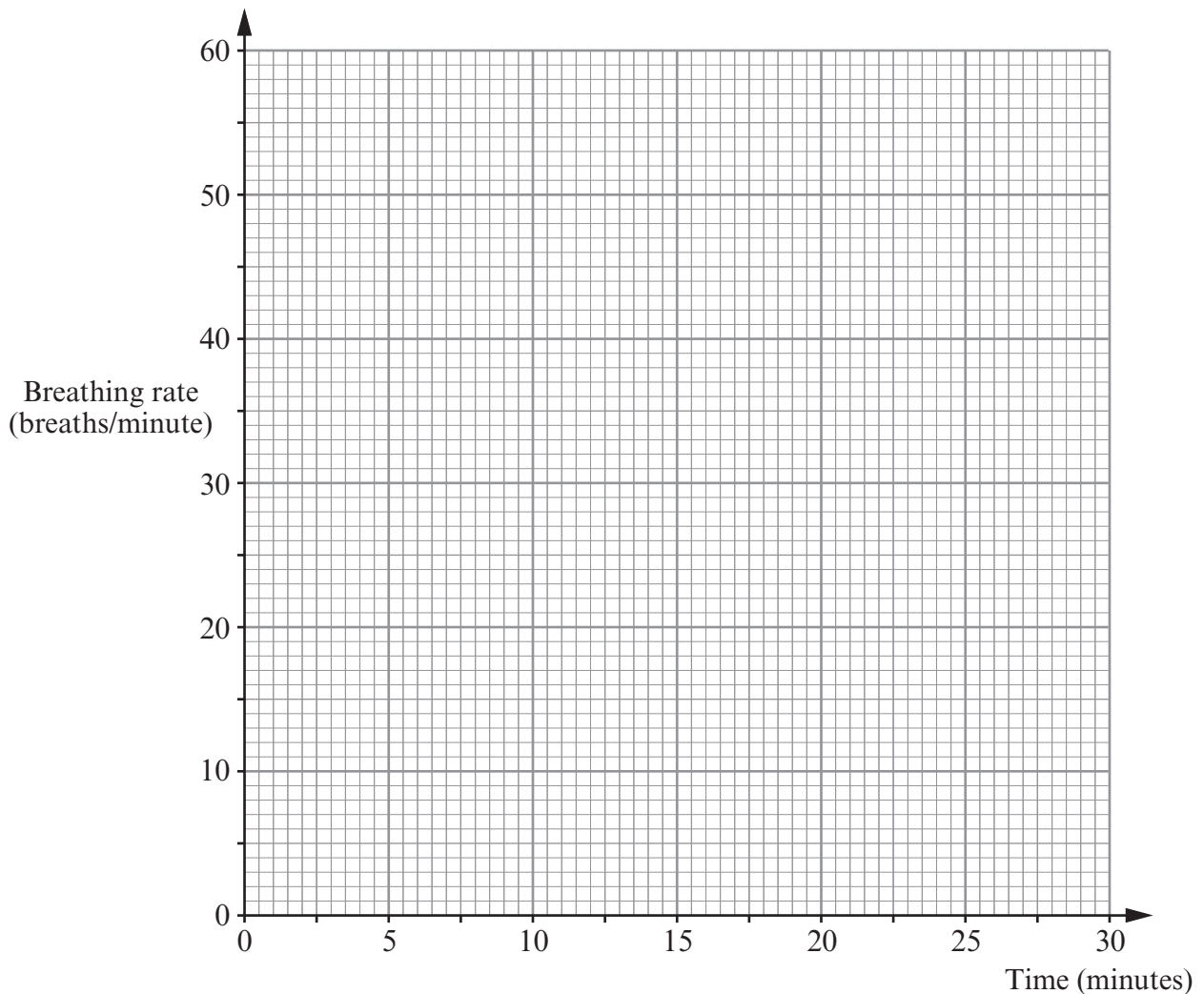
Answer **all** the questions in the spaces provided.

6. A physiologist measures the breathing rate of an athlete before, during and after exercise. The results are shown below.

<i>Time (minutes)</i>	0	5	10	15	20	25	30
<i>Breathing rate (breaths/minute)</i>	12	26	45	58	34	21	12

- (a) (i) Plot the results on the grid below and join them point to point.

[3]



- (ii) At what time did the physiologist tell the athlete to stop exercising?

..... minutes [1]

- (iii) How long did the athlete's breathing rate take to return to normal after she stopped exercising?

..... minutes [1]

(b) Explain why the athlete's breathing rate increases during exercise. [2]

.....
.....

7

7. Health workers are concerned about anorexia.

(a) What is anorexia? [2]

.....
.....

(b) Anorexia is more common in teenage girls than boys. Give **one** reason why. [1]

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

(c) Describe the long-term health problems associated with anorexia. [2]

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

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