

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

P.M. THURSDAY, 19 May 2011

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	10	
2.	5	
3.	8	
4.	6	
5.	7	
6.	6	
7.	6	
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. (a) Trainee dieticians are learning about parts of the diet.
Draw one line from each part of the diet to its function.

[7]

<i>Part</i>	<i>Function</i>
Carbohydrates	Repair of body tissues
Fats	Insulation
Proteins	Energy providers
Fibre	Helps the body absorb iron
Vitamin C	Prevents constipation
Iron	Healthy teeth and bones
Calcium	Helps the body make haemoglobin

- (b) Complete the sentences below by underlining the most appropriate food in the brackets.

(i) A food that is a good source of protein is (eggs / bread rolls / oranges). [1]

(ii) A food that is a good source of vitamin C is (eggs / bread / oranges). [1]

- (c) Name the part of the diet that should be reduced to prevent heart disease.

.....

[1]

2. Manufacturers of sporting equipment use different types of materials.

(i) The soles of high performance athletic trainers are made from polymers.



Underline three properties of polymers in the list below.

[3]

low density	high tensile strength	flexible	hard	poor conductor	high density
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(ii) The modern pole used in pole vaulting is made from fibreglass. They used to be made of solid wood.

Give **two** advantages of using fibreglass instead of wood.

[2]

1.
2.

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3. During a police investigation, a forensic scientist tests a powder she suspects contains potassium chloride, which is an ionic compound.



- (a) (i) Write down the chemical symbol for potassium. [1]
- (ii) Write down the chemical symbol for chlorine. [1]
- (b) (i) Potassium forms positive ions. State the charge of chloride ions.
..... [1]
- (ii) Give a reason why potassium and chloride ions attract each other. [1]
.....
- (c) The forensic scientist could use a flame test to see which metal the powder contains.
Which element in potassium chloride is the metal? [1]
- (d) The forensic scientist carries out more tests on the powder. They identify the type of salt by comparing their results to the table below.

<i>Procedure</i>	<i>Expected observation</i>	<i>Type of salt</i>
Add hydrochloric acid	Carbon dioxide is given off	Carbonate
Add nitric acid then silver nitrate	Thick white precipitate	Chloride
Add iron(II) sulphate solution followed by sulphuric acid	Brown ring forms	Nitrate
Add a solution of barium chloride	White precipitate	Sulphate

State which procedure could be used to show the powder is a chloride. [1]
.....

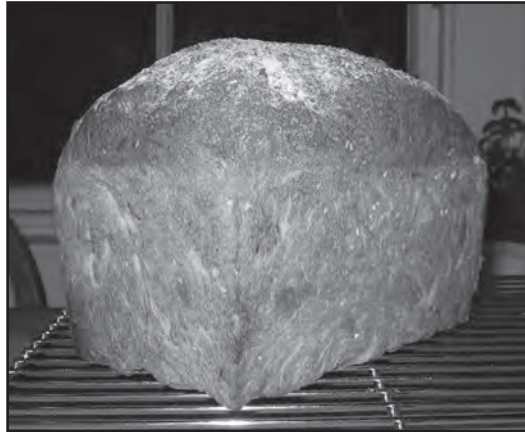
- (e) The forensic scientist finds blood in some samples of the powder collected.

State **two** pieces of information that can be obtained from the blood. [2]

1.

2.

4. Bakers use yeast. Yeast is a fungus used for bread making. It responds to warm water. When exposed to sugar in bread mixture and in flour, it breaks down these sugars due to fermentation. This reaction releases bubbles of carbon dioxide. The mixture is left for a while for it to rise before being put in the oven. The bread continues to rise during its early cooking stage.



- (i) What type of microorganism is yeast? [1]
- (ii) Give **one** reason why yeast is added to warm water instead of cold water. [1]
.....
- (iii) Name the process that involves yeast breaking down sugar. [1]
.....
- (iv) Name the gas produced during the reaction. [1]
- (v) Give **one** reason why the bread mixture rises at first. [1]
.....
- (vi) Give **one** reason why the bread will stop rising during the later stages of cooking. [1]
.....

5. A physiologist monitors the cardiovascular system of an athlete. Before exercise the athlete's heart rate is 65 beats per minute and their breathing rate is 8 breaths per minute.

(a) (i) During exercise, what will happen to the heart rate of the athlete? [1]
.....

(ii) Give a reason for your answer. [1]
.....
.....

(b) (i) During exercise, what will happen to the breathing rate of the athlete? [1]
.....

(ii) Give a reason for your answer. [1]
.....
.....

(c) As the athlete becomes fitter, their recovery time will improve.

(i) What is meant by the term 'recovery time'? [1]
.....
.....

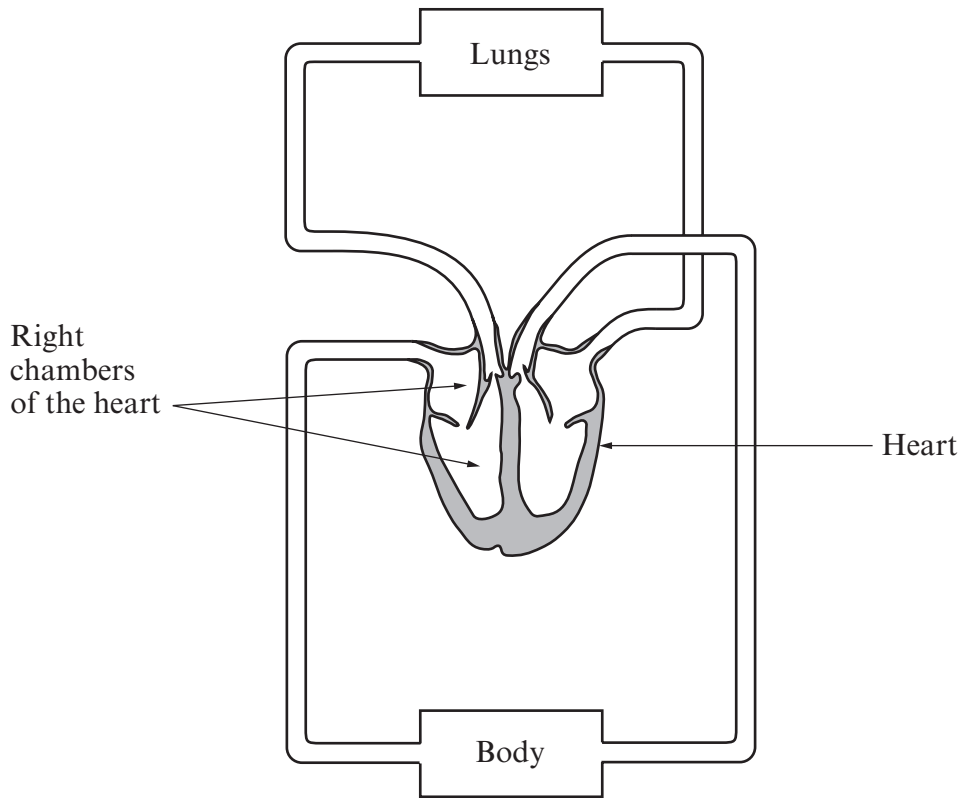
(ii) Describe how the physiologist measures the heart rate of the athlete. [1]
.....
.....

(iii) What is the heart rate of the athlete after the recovery time? [1]

SECTION B (12 marks)

Answer all the questions in the spaces provided.

- 6. Elite athletes need an efficient cardiovascular system to perform at the highest level. The diagram shows the human cardiovascular system.



- (a) (i) Name the chambers on the right of the heart. [2]
 and
- (ii) Name the chamber that pumps blood to the lungs. [1]
- (iii) Name the chamber that receives blood from the lungs. [1]
- (b) Explain why the cardiovascular system is a double circulatory system. [2]

.....

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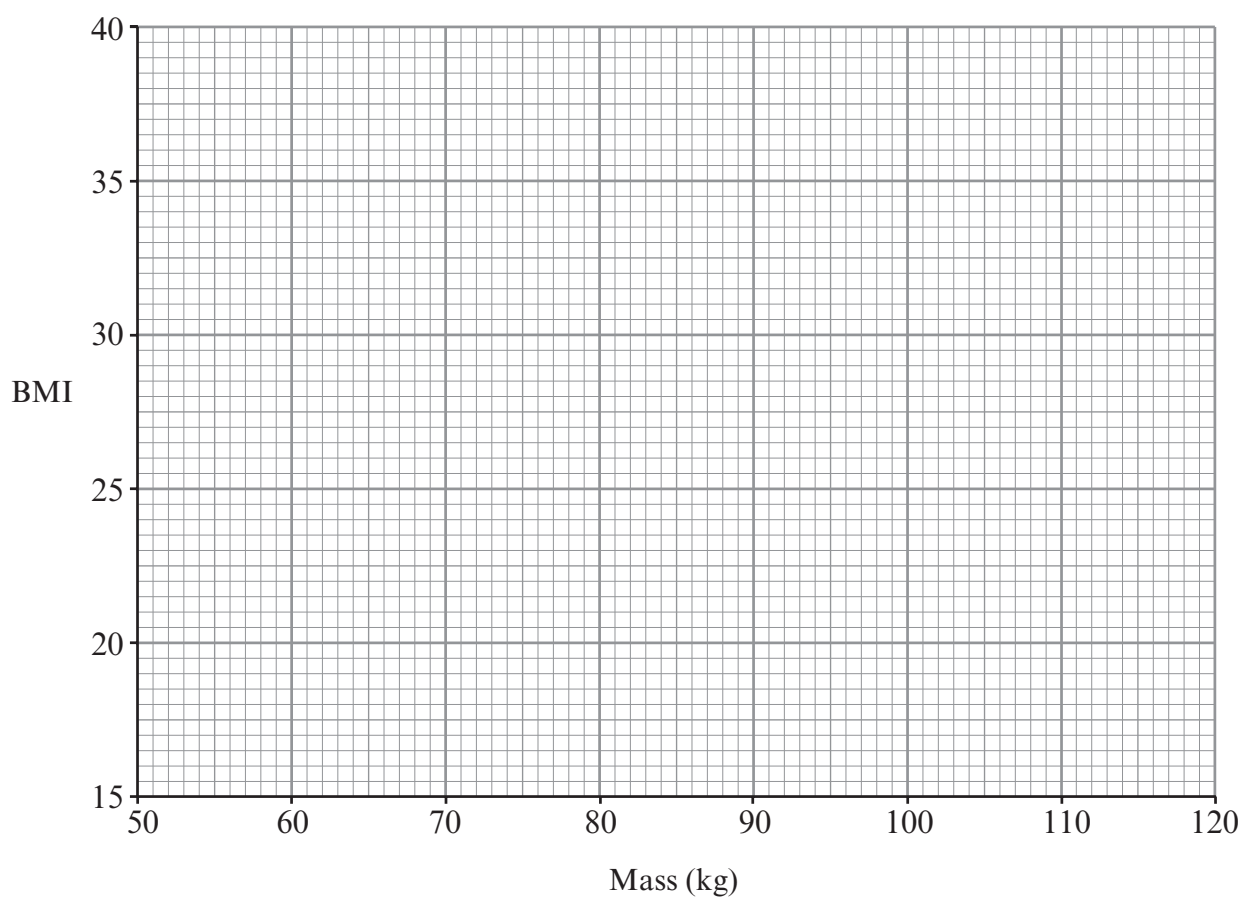
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7. The table shows how the Body Mass Index (BMI) of a 170 cm tall adult varies with mass.

<i>Mass (kg)</i>	<i>BMI</i>
53.5	18.5
63.5	22
72.5	25
86.0	30
115.0	40

(a) (i) Use the data to plot a graph on the grid below.

[3]



(ii) Use the graph to estimate the BMI for a mass of 80 kg. [1]

(iii) Use the graph to estimate the mass for a BMI of 35. [1]

(b) Values of BMI give the following body types.

Obese (>30)

Overweight (25-30)

Normal (18.5-25)

Underweight (<18.5)

Use the information above, to find the lowest mass at which a 170 cm adult will be classed as obese. [1]

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