Diet

Question Paper 1

Level	International A Level
Subject	Biology
Exam Board	Edexcel
Topic	Molecules, Transport and Health
Sub-Topic	Diet
Booklet	Question paper 1

Time Allowed: **53 minutes**

Score: **/44**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

1 The photograph below shows broccoli, a green vegetable.

Green vegetables are a source of vitamin C. Cooking can reduce the vitamin C content of vegetables.

© Flagstaffotos

Magnification ×1

(a) Describe how the vitamin C content of broccoli could be measured.

(4)

.....

.....

.....

.....

.....

.....

.....

.....

(b) The vitamin C content of uncooked broccoli is 89.2 mg per 100 g.

A student investigated the effect of different cooking methods on the vitamin C content of broccoli.

The table below shows the effect of boiling or microwave cooking, for different times, on the vitamin C content of broccoli.

Method of cooking	Time of cooking / minutes	Vitamin C content of broccoli / mg per 100 g
Boiling	2	80.3
	4	71.4
	8	62.4
Microwave	2	86.5
	4	84.7
	8	66.9

(i) Using the information in the table, compare the effect of these two cooking methods on the vitamin C content of broccoli.

(2)

.....

.....

.....

.....

.....

.....

.....

.....

.....

(ii) Describe **one** way in which the student could ensure that the results were valid.

(1)

.....

.....

.....

.....

(iii) Vitamin C is not destroyed by the cooking methods used in this investigation.

Suggest why the vitamin C content of broccoli changes when broccoli is boiled.

(3)

.....

.....

.....

.....

.....

(Total for Question 1 = 10 marks)

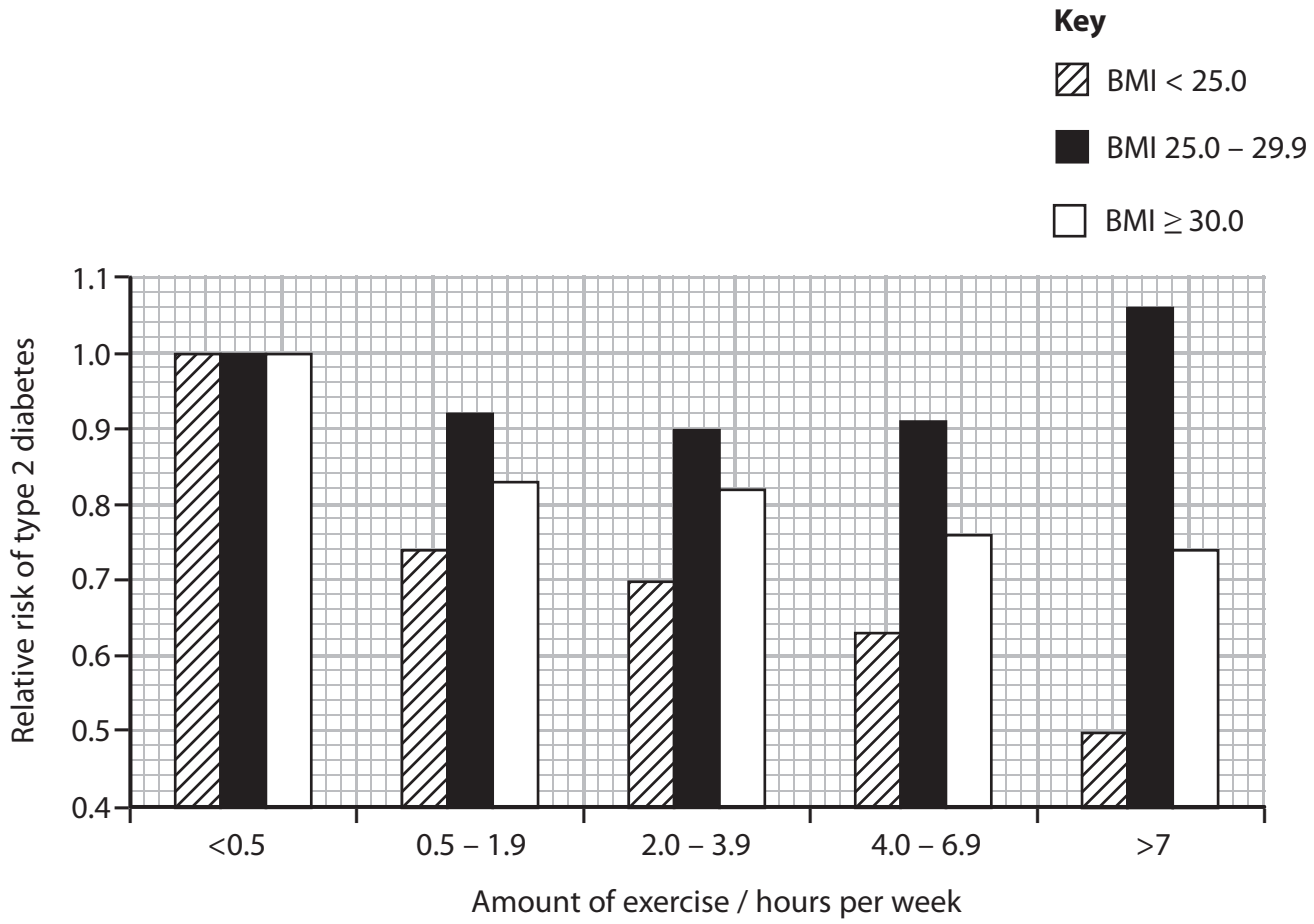
2 Diabetes is a condition that causes a person's blood glucose level to become too high.

Type 2 diabetes occurs when not enough insulin is produced or when cells do not react to insulin.

Obesity, measured using body mass index (BMI), and amount of exercise are associated with the relative risk of developing type 2 diabetes.

In one study, scientists used online questionnaires to collect information from 84 000 female nurses.

The results of this study are shown in the graph below.



(a) Suggest what is meant by the term **relative risk**.

(2)

.....

.....

.....

.....

.....

(b) Using the information in the graph, describe the effect of exercise on the relative risk of developing type 2 diabetes for the three BMI groups.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(c) Suggest the health advice that could be given to a person with a BMI greater than 30.0, to reduce the risk of type 2 diabetes.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

(d) Suggest why questionnaires were used to collect the data in this study.

(1)

.....

.....

(e) Suggest **two** reasons why these results cannot be applied to all people at risk of type 2 diabetes.

(2)

1 .....

.....

2 .....

.....

(Total for Question 2 = 11 marks)

3 Asim has been warned by his doctor that he is at an increased risk of cardiovascular disease (CVD) because of his current high-fat diet and low activity levels.

*(a) Explain why the combination of a high-fat diet and low activity levels may lead to CVD.

(5)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

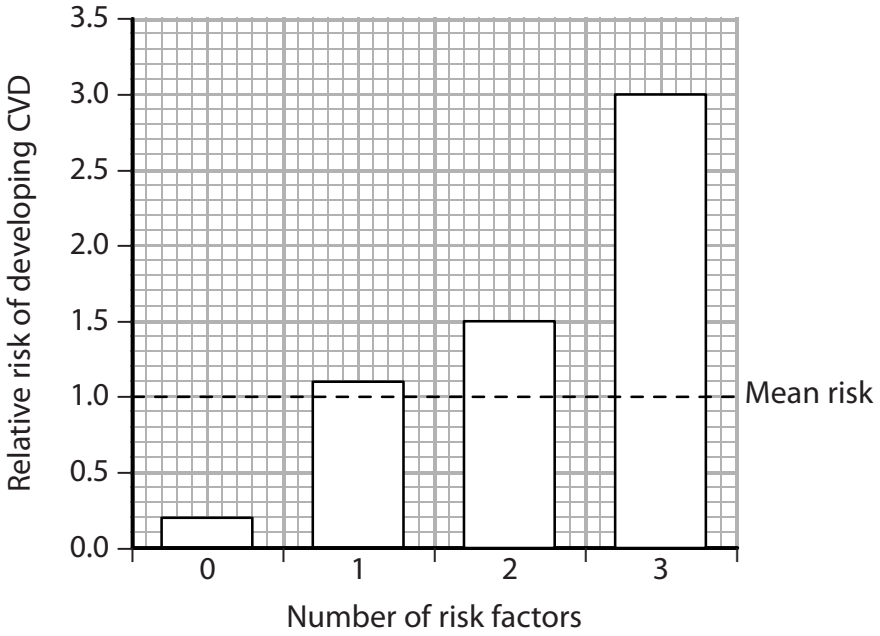
.....

.....

.....

.....

(b) The bar chart below shows how the number of risk factors affects the risk of developing CVD.



(i) Using the information in the bar chart, describe the relationship between the number of risk factors and the risk of developing CVD.

(2)

.....

.....

.....

.....

.....

(ii) Suggest **one** change in diet, other than reducing saturated fats, which could help reduce the risk of developing CVD.

(1)

.....

.....

(c) Statins can be used to treat CVD.

Give **one** risk associated with the use of statins.

(1)

.....

.....

.....

(d) Diuretics are antihypertensive drugs used to treat some people with CVD. They cause an increase in fluid loss from the body by stimulating urine production.

Suggest how diuretics can help reduce the risk of CVD.

(2)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 3= 11 marks)

4 Over 20% of the population of the UK is classified as obese. Obesity is a significant risk factor in the development of cardiovascular disease (CVD).

(a) One way of estimating if a person is obese is to find their Body Mass Index (BMI). Body Mass Index is calculated using the formula below.

$$\text{BMI} = \frac{\text{Mass in kilograms}}{(\text{height in metres})^2}$$

The table below provides the range of BMI values for different categories of people.

Category	BMI range
Very severely underweight	less than 15.0
Severely underweight	from 15.0 to 15.9
Underweight	from 16.0 to 18.4
Normal (healthy weight)	from 18.5 to 24.9
Overweight	from 25.0 to 29.9
Obese Class I (moderately obese)	from 30.0 to 34.9
Obese Class II (severely obese)	from 35.0 to 39.9
Obese Class III (very severely obese)	over 40.0

(i) Calculate the BMI of a person who has a mass of 95 kg and a height of 1.75 metres.

(1)

Answer .....

(ii) Use your calculated value and the information in the table to find the category of this person.

(1)

Category .....

*(iii) People in this category are more likely to develop high blood pressure than people with a healthy weight.

Explain why someone who has a high blood pressure is at a significantly higher risk of developing CVD.

(4)

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(b) Suggest **one** piece of medical advice that could be given to someone who does not have high blood pressure but who is obese.

Explain why this will help to reduce their risk of developing CVD.

(3)

Medical advice: .....

.....

Why this will reduce the risk of developing CVD: .....

.....

.....

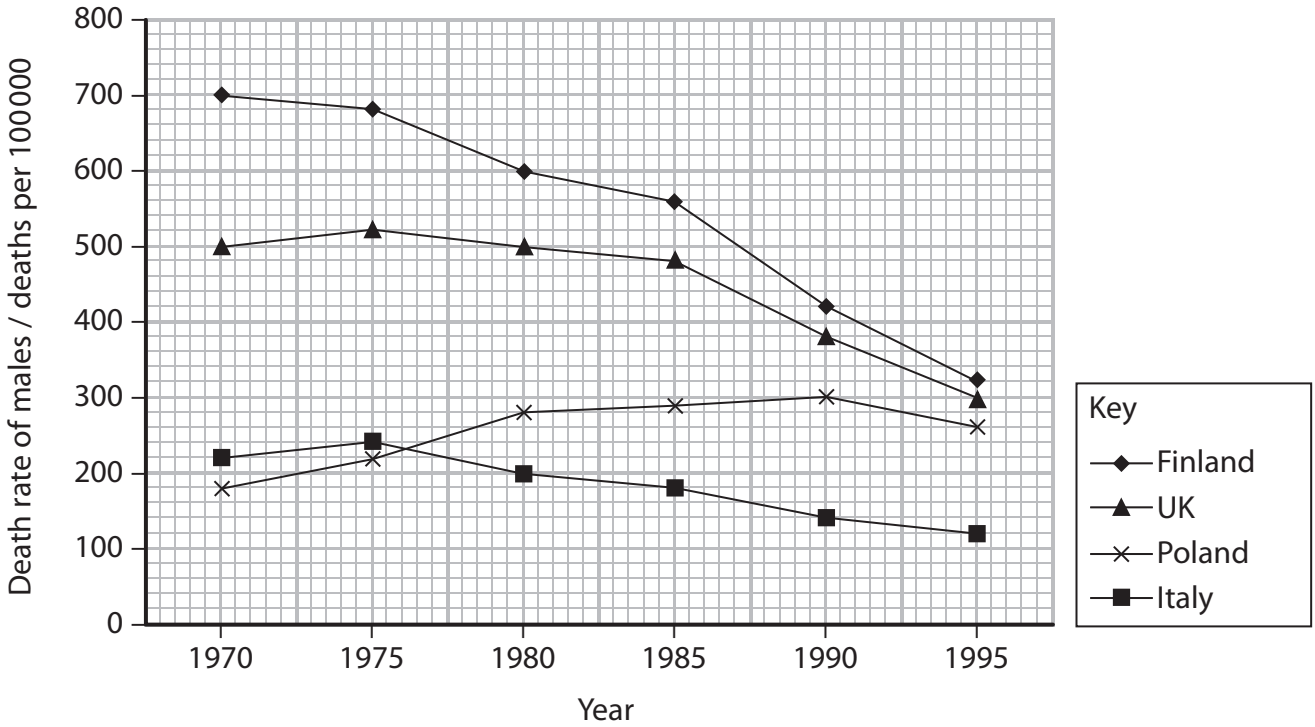
.....

.....

.....

.....

(c) The graph below shows the death rates from CVD for men from four different European countries.



Using the information in the graph, discuss the statement that death rates from CVD are falling.

(3)

.....

.....

.....

.....

.....

.....

.....

.....

.....

(Total for Question 4 = 12 marks)