Q1. It is legal in the UK to use certain recreational drugs but illegal to use others.

(a) Tobacco is a legal drug. Pregnant women are strongly advised not to smoke.

Explain how a fetus may be affected if the mother smokes tobacco.

....

....

....

....

(2)

(b) Illegal drugs are classified as Class **A**, **B** or **C**. Class **A** drugs are the most dangerous. The use of Class **A** drugs attracts the most serious punishments and fines.

- Cannabis is a Class **C** drug.

- These are some facts about cannabis.

- It is less addictive than amphetamines, tobacco or alcohol.

- It may cause mental illness.

- It does not seem to cause major social problems.

- It may be a 'gateway' drug to more harmful substances.

- It has a higher tar content than tobacco.

- It has an effect on the heart, similar to the effects of exercise.

- It can upset the control of blood pressure.

- Use the above information to answer these questions.

(i) Give **two** reasons why many people think that cannabis should be classified as a Class **A** or Class **B** drug.

1. ....

....

2. ....

....

(2)

(ii)   Give **two** reasons why many people think that cannabis should not be classified as an illegal drug.

1. ....

....

2. ....

....

(2)
(Total 6 marks)

Q2.   Many people use drugs recreationally.

(a)   (i)   What is meant by the recreational use of drugs?

....

....

(1)

(ii)   Explain why a person might become addicted to a recreational drug.

....

....

....

....

(2)

(b) Some people move on from using one type of recreational substance to using another.

Some recreational substances are legal, but some are illegal.

Illegal drugs are classified as Class A, B or C. Class A drugs are the most dangerous.

The table below shows government statistics linking the use of pairs of recreational substances.

A '+' in the table shows that there is a strong statistical link between the use of two substances.

For example, people who use solvents are very likely to have used tobacco before using solvents. This is shown by a '+,' in the table.

Substance used first	Substance used later									
	Legal substances			Class C drug	Class B drugs			Class A drugs		
	Tobacco	Alcohol	Solvents	Cannabis	Amphetamine	Tranquilliser	Ecstasy	Cocaine	Crack	Heroin
Tobacco		+	+	+	+		+		+	
Alcohol	+		+	+	+	+	+	+		
Solvents				+	+					
Cannabis	+	+			+	+	+	+		
Amphetamine						+	+	+	+	
Tranquilliser			+						+	+
Ecstasy								+		+
Cocaine			+						+	
Crack										+
Heroin									+	

(i) Many people think that using cannabis leads onto using class A drugs.

Does the data in the table support this view?

Draw a ring around your answer. **Yes / No**

Use data from the table to support your answer.

....

....

(1)

(ii)   What is most likely to lead people to use class A drugs?

Use data from the table to support your answer.

....

....

....

....

(2)
(Total 6 marks)

Q3.   Many people use recreational drugs.

(a)   Give **one** example of:

(i)   a legal recreational drug

....

(1)

(ii)   an illegal recreational drug.

....

(1)

(b)   Some recreational drugs are addictive.

(i)   Give **one** example of a recreational drug that is very addictive.

....

(1)

(ii)   Explain how the action of a drug makes a person become addicted to it.

....

....

(1)

(c)   Some doctors think that smoking cannabis causes depression.

Doctors investigated the cannabis smoking habits of 1500 young adults.

The table shows the percentage of cannabis smokers in the investigation who became depressed.

How many times the men or women had smoked cannabis in the last 12 months	Percentage of men who became depressed	Percentage of women who became depressed
Less than 5 times	9	16
More than 5 times, but less than once per week	10	17
1 – 4 times per week	12	31
Every day	15	68

From the data, give **two** conclusions that can be drawn about the relationship between cannabis and depression.

1 ....

....

2 ....

....

(2)
**(Total 6 marks)**

Q4.   Some athletes use drugs containing the steroid testosterone to improve their performance.

In an investigation:

•   scientists monitored the performance of 18 male athletes over a 6 week training programme

•   9 athletes were given weekly injections of testosterone with the dose of 3.5 milligrams per kilogram of body mass, for 6 weeks

•   the other 9 athletes were given a placebo

•   the athletes' performance on a bench press exercise was measured at 3 weeks and 6 weeks.

The graph shows the results of the investigation.
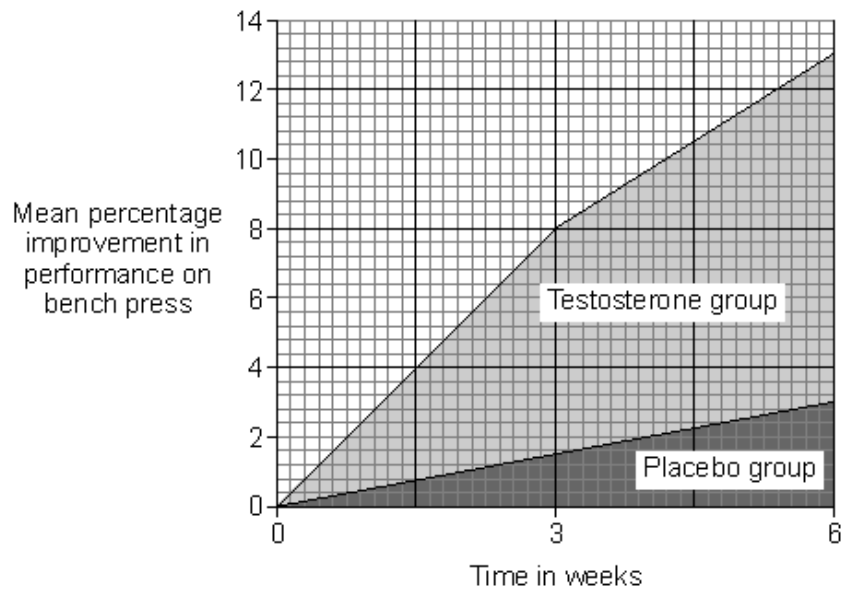
David Cohen, *Steroids boost performance in just weeks*,
© New Scientist Magazine 12 August 2004

(a) The data would have been better presented as a bar chart.

Give a reason why.

....

....

(1)

(b) Suggest what was given as a placebo in this investigation.

....

....

(1)

(c) Describe the results of the investigation.

....

....

....

....

....

(2)

(d)   Most internet advertisements for testosterone state that athletes need to use testosterone for at least 10 weeks to significantly improve performance.

Do the results of this investigation support the statement in the advertisements?

Give **one** reason for your answer.

....

....

(1)
(Total 5 marks)

Q5.   Diet and exercise affect health.

(a)   Many people are obese (very overweight).
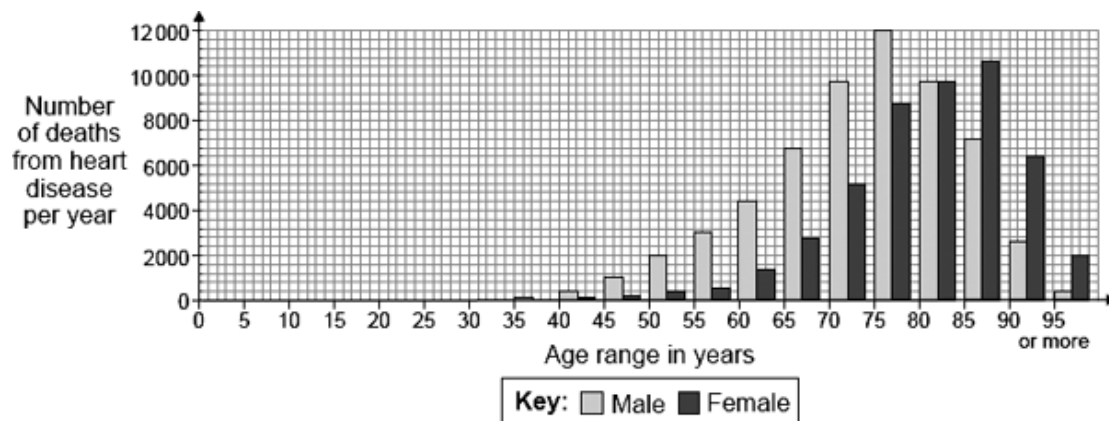
Obesity can lead to heart disease.

Other than heart disease, name **two** conditions which are linked to obesity.

1 ....

2 ....

(2)

(b)   The graph shows the number of deaths from heart disease each year in the UK.

The pattern for deaths from heart disease in men is different from the pattern in women.

(i)   Give **two** differences between the patterns for men and women.

1 ....

....

2 ....

....

(2)

(ii)   Suggest **two** reasons for the difference in the number of deaths from heart disease in men and women between the ages of 40 and 60.

1 ....

....

2 ....

....

(2)

(c)   Scientists have developed drugs to reduce the concentration of cholesterol in the blood.

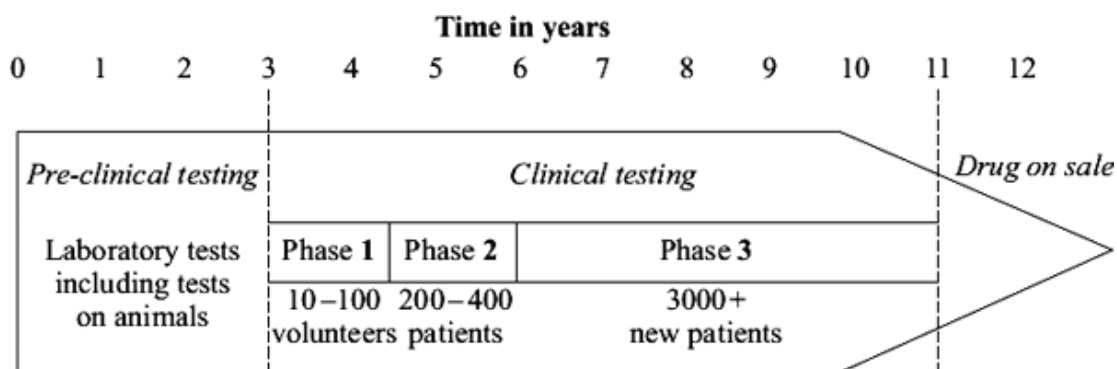Give the **three** main stages in testing a new drug before it is sold to the public.

1 ....

....

2 ....

....

3 ....

....

(3)
(Total 9 marks)

Q6.   New drugs have to be thoroughly tested before they are sold.

The diagram shows a time line for the testing of a new drug.

(a)   What is the main purpose of *pre-clinical testing?*

....

....

(1)

(b)   In Phase **1** of the *clinical testing,* very low doses of the new drug are used on a small number of volunteers.

(i)   What is the main purpose of Phase **1** testing?

....

....

(1)

(ii)   In Phase **1** testing, healthy volunteers are used rather than patients.

Suggest **one** reason for this.

....

....

(1)

(c)   What is the main purpose of the Phase **2** and Phase **3** testing?

....

....

(1)

(d)   During Phase **3** testing, many of the patients are given a *placebo.*

(i)   What is meant by a *placebo?*

....

....

(1)

(ii)   During the testing, who knows which patients are receiving the *placebo?*

Tick (✔) **one** box.

Only the patients   ☐

Only the doctors   ☐

Both patients and doctors   ☐

Neither patients nor doctors   ☐

(1)
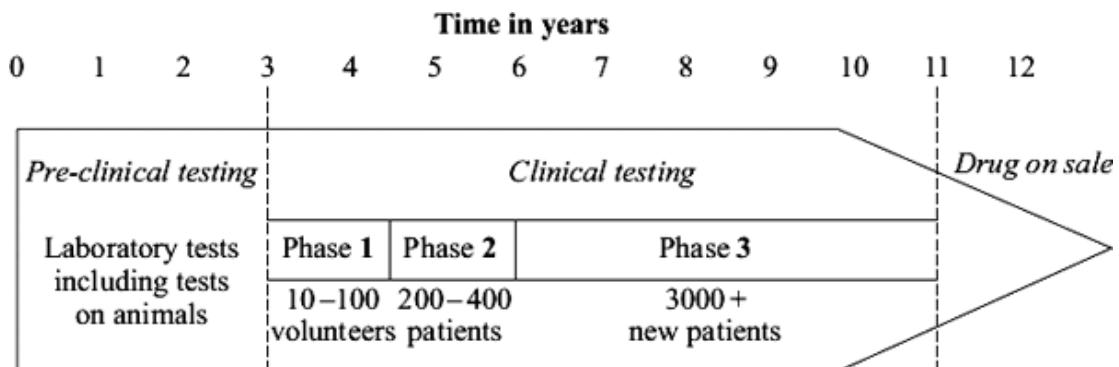**(Total 6 marks)**

Q7. Medicinal drugs are used to treat diseases.

(a) Draw **one** line from each drug to its correct use.

Drug

Use

Used as a fertility drug

Painkiller

Used to relieve disease symptoms

Statin

Used to treat leprosy

Thalidomide

Used to lower blood cholesterol

(3)

(b) New drugs need to be tested before going on sale.

The diagram shows a time line for the testing of a new drug.

Time in years

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

Pre-clinical testing | Clinical testing | Drug on sale

Laboratory tests including tests on animals

Phase 1 | Phase 2 | Phase 3

10–100 volunteers | 200–400 patients | 3000+ new patients

(i) How long do trials on humans take? .... years

(1)

(ii) What is the minimum number of humans the drug is tested on throughout *clinical testing?*

....

(1)

(c) Draw a ring around the correct answer to complete each sentence.

(i) A new drug is first tested in the laboratory to find

| if it is toxic. |
| if it is cost effective. |
| the optimum dose. |

(1)

(ii) The drug is then tested on a few volunteers to find

| if it is cost effective. |
| if it has side effects. |
| the optimum dose. |

(1)
(Total 7 marks)

Q8. Scientists have trialled a new statin called rosuvastatin.

• 17 802 people took part in the trial.

• All of these people had high levels of a protein called CRP in their blood.

• The higher the level of CRP in the blood, the higher the risk of a heart attack.

• None of these people had heart conditions at the beginning of the investigation.

• None of these people had high LDL (low density lipoprotein) levels.

• All of these people were aged 50 or above.

• Half the people were given a rosuvastatin tablet each day; the other half were given a placebo.

• The trial was stopped 7 months early when it was found that the people given rosuvastatin were 54% less likely to have a heart attack than people given the placebo.

(a) Give **two** control variables in this investigation.

1 ....

2 ....

(2)

(b) What would the placebo be in this investigation?

....

....

(1)

(c)   The trial gave reliable results.

Give **one** reason why.

....

....

(1)

(d)   The trial was stopped 7 months early.

Give **one** reason why.

....

....

(1)

(e)   The manufacturers of rosuvastatin paid for the trial.

However, the manufacturers took no part in the trial.

Suggest **one** reason why the manufacturers did not take part in the trial.

....

....

(1)

(f)   The table shows some of the results of the trial.

Substance	Concentration in blood in mg per 100 cm³ after 3 years of trial	
	People given rosuvastatin	People given placebo
LDL cholesterol	53	106
HDL cholesterol	50	49
Saturated fats	106	123

Rosuvastatin reduces the risk of heart attacks.

Use the data in the table to explain why.

....

....

....

....

(2)
(Total 8 marks)

Q9.   (a)   **List A** gives the names of three stages in trialling a new drug.

List B gives information about the three stages.

Draw a line from each stage in **List A** to the correct information in **List B**.

List A
Stage

List B
Information

Used to find if the drug is toxic

Tests on humans
including a placebo

The first stage in the clinical trials
of the drug

Tests on humans using
very small quantities of
the drug

Used to find the optimum dose
of the drug

Tests on animals

Used to prove that the drug is
effective on humans

(3)

(b)   Read the passage.

<div style="border:1px solid black; padding:10px;">

Daily coffee dose delays development of Alzheimer's in humans.

Alzheimer's is a brain disease that causes memory loss in elderly people. Scientists studied 56 mice that had been genetically engineered to develop Alzheimer's.

Before treatment all the mice did badly in memory tests.

Half the mice were given a daily dose of caffeine in their drinking water. The dose was equivalent to the amount of caffeine in six cups of coffee for a human.

The other mice were given ordinary water.

After two months, the caffeine-drinking mice did better in memory tests than the mice drinking ordinary water.

</div>

The headline for the passage is not justified.

Explain why as fully as possible.

....

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....

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....

....

(3)
(Total 6 marks)

Q10.   Scientists at a drug company developed a new pain-killing drug, drug **X**.

(a)   Painkillers do **not** cure infectious diseases.

Why?

....

(1)

(b)   The scientists compared drug **X** with two other pain-killing drugs, drug **A** and drug **B**.
In their investigation the scientists:
- chose 600 volunteers. The volunteers were all in pain
- gave 200 of the volunteers a standard dose of drug **A**
- gave 200 of the volunteers a standard dose of drug **B**
- gave 200 of the volunteers a standard dose of drug **X**.

Over the next seven hours the volunteers recorded how much pain they felt.

To get valid results the three groups of volunteers should be matched for as many factors as possible.

Suggest **two** of the factors that should be matched.

....

....

(2)

(c)   The graph shows the results of the investigation.
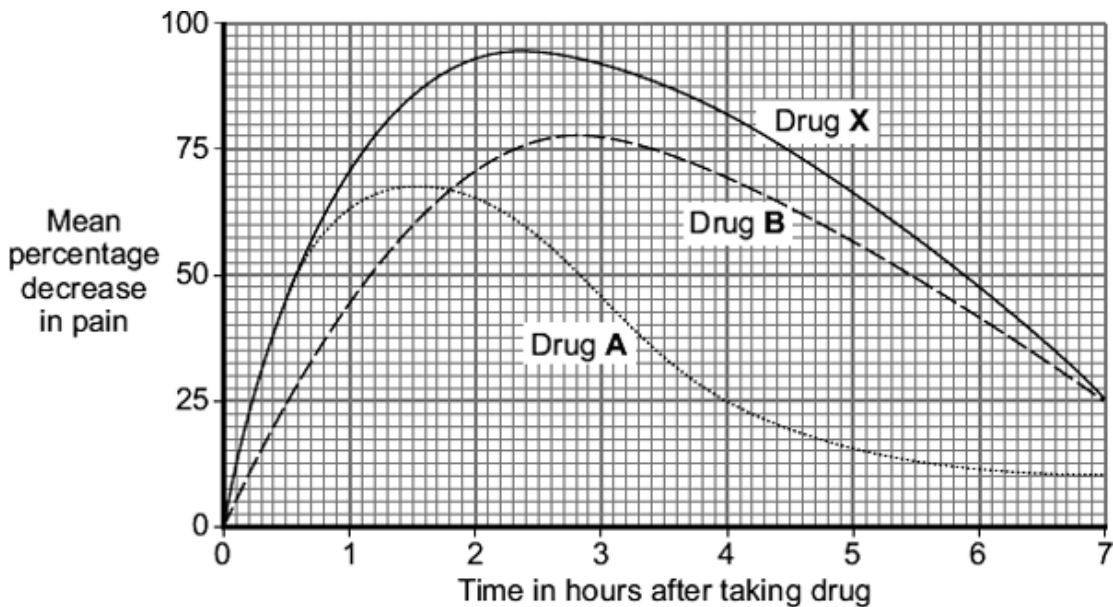
(i)   How much pain did the volunteers still feel, four hours after taking drug **A**?

.... percent

(1)

(ii)   Give **one** advantage of taking drug **A** and **not** drug **B**.

....

....

(1)

(iii)   Give **two** advantages of taking drug **B** and **not** drug **A**.

....

....

....

....

(2)

(d)   Drug **X** is much more expensive than both drug **A** and drug **B**.

A pharmacist advised a customer that it would be just as good to take drug **A** and drug **B** together instead of drug **X**.

Do you agree with the pharmacist's advice?

Give reasons for your answer.

....

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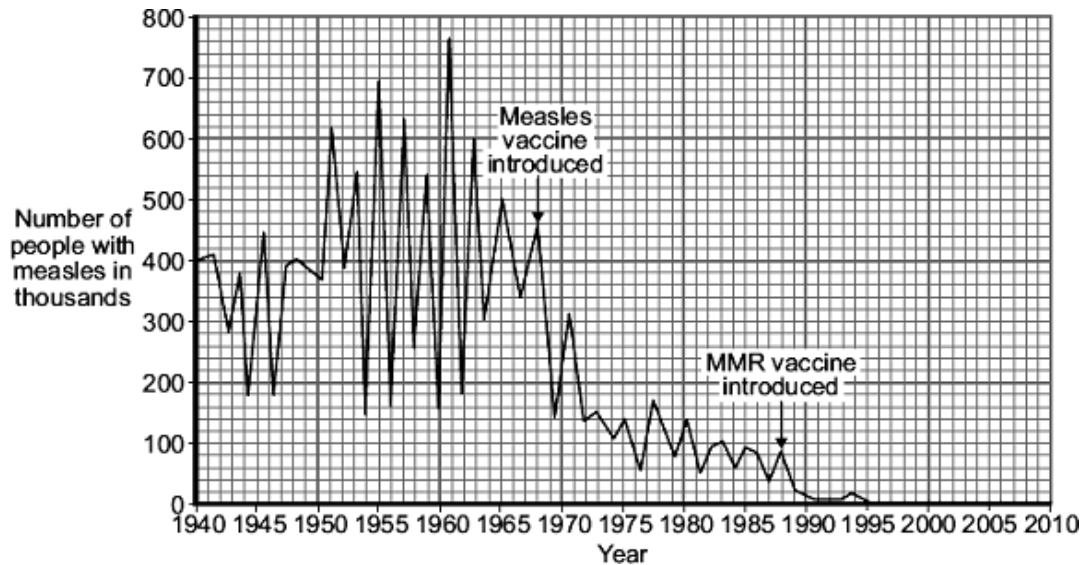
(3)
(Total 10 marks)

Q11. The graph shows the number of people with measles in the UK between 1940 and 2010.

©Health Protection Agency

(a) Compare how effective introducing the measles vaccine was with introducing the MMR vaccine.

Use data from the graph.

....

....

....

....

....

....

....

....

(3)

(b) The MMR vaccine was introduced in 1988.

Other than measles, which **two** diseases does the MMR vaccine protect against?

1 .... 2 ....

(2)

(c)   To immunise someone against measles, a small quantity of the inactive measles pathogen is injected into the body.

Describe what happens in the body after immunisation to stop a person catching measles in the future.

....

....

....

....

....

....

....

....

(3)
(Total 8 marks)

Q12.   Many people use recreational drugs.

(a)   Some recreational drugs are addictive.

(i)   Give **one** example of a recreational drug that is very addictive.

....

(1)

(ii)   People may suffer withdrawal symptoms when they become addicted to drugs.

How does the action of a drug make a person become addicted to it?

....

....

(1)

(b)   Some doctors think that smoking cannabis causes depression.

Doctors investigated the cannabis smoking habits of 1500 young adults.

The table shows the percentage of the cannabis smokers in the investigation who became depressed.

How many times the men or women had smoked cannabis in the last 12 months	Percentage of men whobecame depressed	Percentage of women who became depressed
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1 – 4 times per week	12	31
Every day	15	68

From the data, give **two** conclusions that can be drawn about the relationship between cannabis and depression.

1 ....

....

2 ....

....

(2)
(Total 4 marks)