Resources available from kickstart tutors

Student number

Name _____

Date _____

Attempt/Time taken _____

GCSE
BIOLOGY

Topic Paper: 3.1 Drugs
Part 2

Time allowed: 40 minutes

Materials
For this paper you must have:
- the Periodic Table/Data Sheet, provided as an insert (enclosed)
- a ruler with millimetre measurements
- a calculator, which you are expected to use where appropriate.

Instructions
- Use black ink or black ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- All working must be shown.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The Periodic Table/Data Sheet is provided as in insert.
- You are reminded of the need for good English and clear presentation in your answers.
- When answering questions you need to make sure that your answer:
  - is clear, logical, sensibly structured
  - fully meets the requirements of the question
  - shows that each separate point or step supports the overall answer.

35 Marks

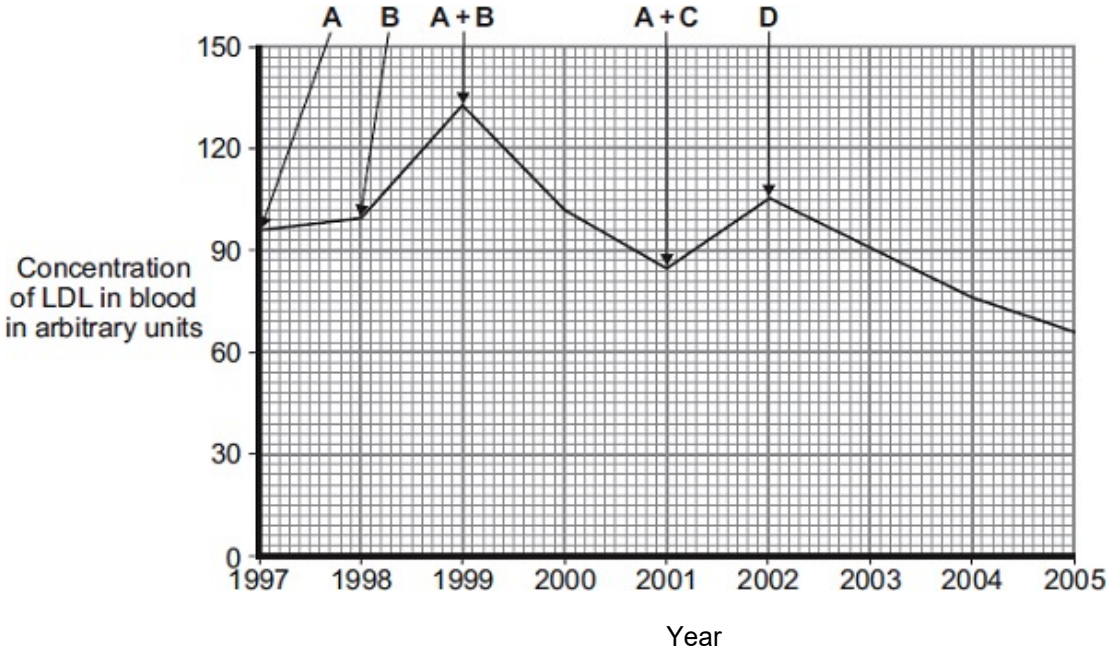
Q7. LDL is one form of cholesterol found in the blood.

People with a high concentration of LDL in their blood may be treated with drugs called statins.

A high concentration of LDL cholesterol in the blood may result in an increased risk of heart and circulatory diseases.

The graph shows the effects of the treatment of one person with four different statins, **A**, **B**, **C** and **D**, over a period of 8 years. The arrows show when each new treatment was started.

Each treatment was continued until the next treatment was started.



Compare the effectiveness of the five treatments in reducing the risk of heart and circulatory diseases for this person.

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(Total 4 marks)

Q8. Read the description of an investigation into the link between smoking cannabis and heroin addiction.

> Six 'teenage' rats were given a small dose of THC – the active chemical in cannabis – every three days between the ages of 28 and 49 days. This is the equivalent of human ages 12 to 18.
>
> The amount of THC given was roughly equivalent to a human smoking one cannabis 'joint' every three days.
>
> A control group of six 'teenage' rats did not receive THC.
>
> After 56 days catheters (narrow tubes) were inserted in all twelve of the now adult rats and they were able to self-administer heroin by pushing a lever.
>
> All the rats began to self-administer heroin frequently. After a while, they stabilised their daily intake at a certain level.
>
> The ones that had been on THC as 'teenagers' stabilised their heroin intake at a much higher level than the others. They appeared to be less sensitive to the effects of heroin. This pattern continued throughout their lives.
>
> Reduced sensitivity to the heroin means that the rats take larger doses. This has been shown to increase the risk of addiction.

Evaluate this investigation with respect to establishing a link between cannabis smoking and heroin addiction in humans.

Remember to include a conclusion to your evaluation.

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(Total 5 marks)

Q9. Some *recreational* drugs are dangerous.

Class A drugs include heroin and cocaine. Class A drugs are very addictive.

(a) It is difficult to stop using addictive drugs.

Explain why.

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(2)

(b) As part of the British Crime Survey, a large, random selection of the UK population is interviewed in their own home about drug use.

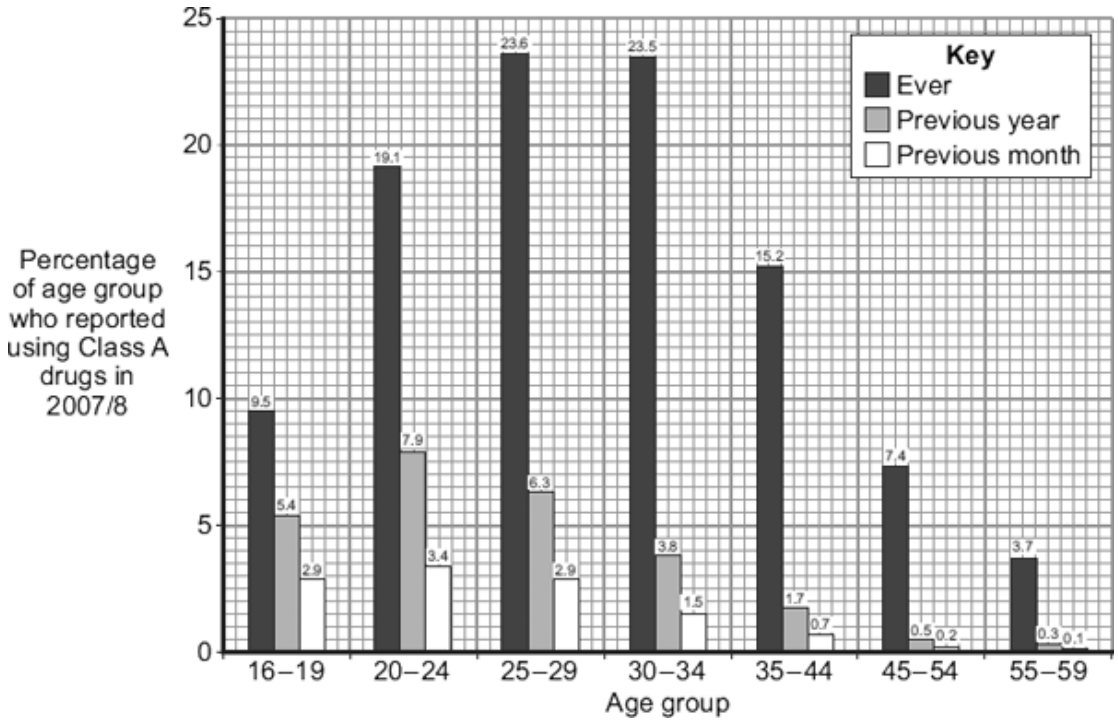
People in the sample:

answer questions about drug use

answer questions on a lap top

do not give their names.

The bar chart shows the percentages of people aged 16-59 by age group who reported using any Class A drug ever, in the previous year and in the previous month.



(i) Describe how the percentage of people who have ever used Class A drugs is related to age.

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(2)

(ii) The percentage of people who reported using Class A drugs in the previous month is highest amongst 16 -29 year-olds.

Suggest **two** reasons for this.

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(2)

(iii) The data in the bar chart is unlikely to be completely accurate.

Explain why.

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(2)
(Total 8 marks)

Q10. Drugs are used to treat cardiovascular diseases (diseases of the heart and blood vessels).

(a) What is a drug?

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(1)

(b) People can be treated for cardiovascular diseases with statins or aspirin.

Information about these two drugs is given in the table.

STATINS	ASPIRIN
Statins are only available on prescription from doctors.	Aspirin can be bought over the counter. Treatment with aspirin costs up to £15 per year.
In studies, 30 000 patients were monitored over several years. Statins were found to reduce the rate of non-fatal heart attacks by about 30%.	In a study of 1000 patients, aspirin was found to cause bleeding of the stomach in around 0.5% of patients and there was a slightly increased risk of poor blood clotting at cuts.
Approximately 0.1% of the patients suffered serious muscle damage and 0.01% suffered kidney failure.	There was a slightly increased risk of damage to the blood vessels in the brain in older patients.
Statins reduce blood cholesterol which builds up in the walls of blood vessels. The cost of treating patients with statins can vary between £150 and £500 per year, depending on the type of cardiovascular disease being treated.	Aspirin was found to reduce the risk of non-fatal heart attacks by 31%.

Would you recommend statins or aspirin for the treatment of cardiovascular diseases?

In your answer you should:

give your recommendation

use information from the table to support your recommendation by making comparisons of the two drugs.

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(5)
(Total 6 marks)

Q11. Drugs must be trialled before the drugs can be used on patients.

(a) (i) Before the clinical trials, drugs are tested in the laboratory.
The laboratory trials are **not** trials on people.

What is the drug tested on in these laboratory trials?

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(1)

(ii) Drugs must be trialled before the drugs can be used on patients.

Give **three** reasons why.

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(3)

(b) Read the information about cholesterol and ways of treating high cholesterol levels.

Diet and inherited factors affect the level of cholesterol in a person's blood.
Too much cholesterol may cause deposits of fat to build up in blood vessels and reduce the flow of blood. This may cause the person to have a heart attack.
Some drugs can lower the amount of cholesterol in the blood.

The body needs cholesterol. Cells use cholesterol to make new cell membranes and some hormones. The liver makes cholesterol for the body.

Some drugs can help people with high cholesterol levels.

Statins block the enzyme in the liver that is used to produce cholesterol.
People will normally have to take statins for the rest of their lives. Statins can lead to muscle damage and kidney problems. Using some statins for a long time has caused high numbers of deaths.

Cholesterol blockers reduce the absorption of cholesterol from the intestine into the blood.
Cholesterol blockers can sometimes cause problems if the person is using other drugs.

Evaluate the use of the two types of drug for a person with high cholesterol levels.

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(6)
(Total 10 marks)

Q12. Many recreational drugs harm the body.

Some people become dependent on a recreational drug.

What happens to people's bodies when they become dependent on a drug?

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(Total 2 marks)