Write your name here

Surname		Other names

Edexcel GCSE

Centre Number

Candidate Number

Biology/Science
Unit B1: Influences on Life

Higher Tier

Tuesday 15 May 2012 – Morning	Paper Reference
Time: 1 hour	**5BI1H/01**

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*****) are ones where the quality of your written communication will be assessed
  – *you should take particular care with your spelling, punctuation and grammar, as well as the clarity of expression, on these questions.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

P 4 0 2 3 5 A 0 1 2 0

PEARSON

BLANK PAGE

Answer ALL questions.

Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Inheritance

1 (a) The earlobes of an individual are detached or attached. This is determined by the alleles inherited from their parents.

detached earlobe   attached earlobe
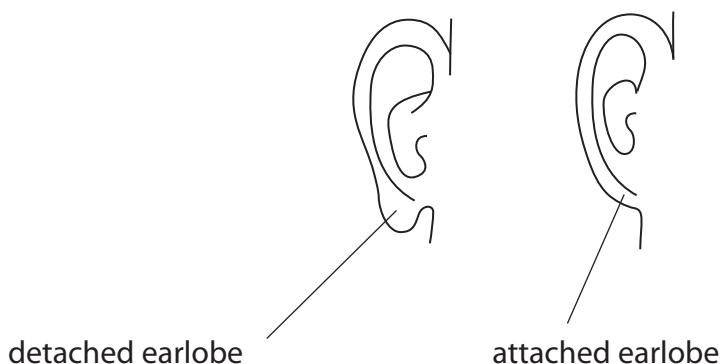
An individual with attached earlobes must have inherited two recessive alleles from each of their parents and will have the genotype **ee**.

(i) State the genetic term used to describe an individual with the genotype **ee** for attached earlobes.

(1)

....

(ii) A female with the genotype **ee** has attached earlobes and a male with the genotype **Ee** has detached earlobes.

Complete the Punnett square to show the gametes and genotypes of the offspring for this female and male.

(2)

female gametes

male gametes

(iii) State the probability of the offspring having detached earlobes.

(1)

(iv) What is the percentage probability of a homozygous dominant mother and homozygous recessive father producing a child with attached earlobes?

Put a cross (⊠) in the box next to your answer.

(1)

⊠ **A**   0%

⊠ **B**   25%

⊠ **C**   75%

⊠ **D**   100%

(b) Cystic fibrosis is a genetic disorder that is caused by the inheritance of two recessive alleles.

Describe the symptoms of cystic fibrosis.

(3)

....

....

....

....

....

....

(Total for Question 1 = 8 marks)

Drugs

2   In the USA, 2.7 million people admitted using illegal drugs.

The pie chart shows the percentage of these people using different illegal drugs.

19.0%
pain relievers

10.7%
inhalants

6.5%
tranquilizers

4.1%
stimulants

2.0%
hallucinogens

1.1%
sedatives

56.0%
marijuana

0.6%
cocaine
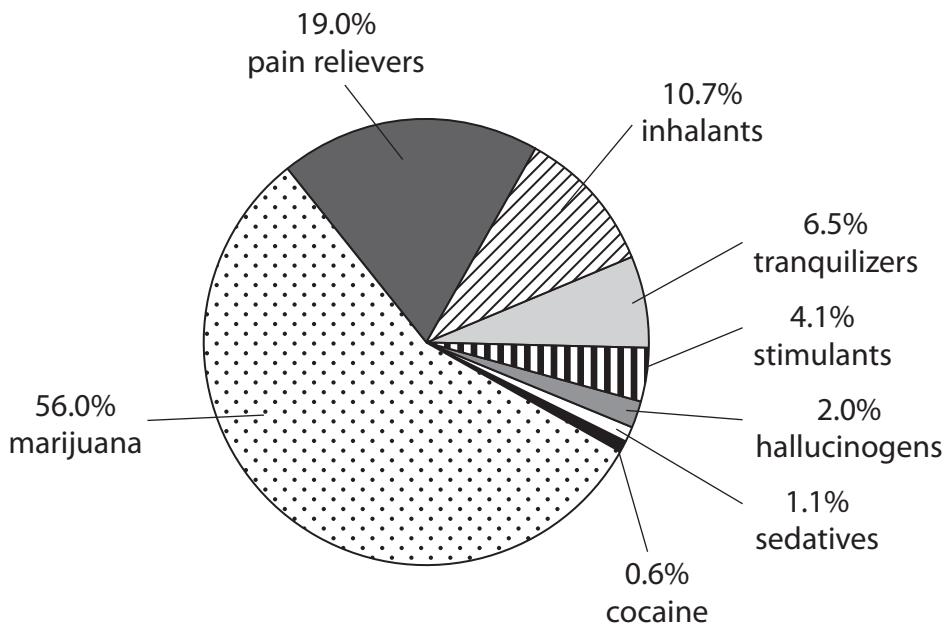
(a) (i)   Calculate the number of people who admitted using marijuana illegally.

(2)

answer = ... million people

(ii) Suggest **one** reason why the information in the pie chart may not be reliable.

(1)

....

....

(b) Marijuana is often smoked with tobacco.

Suggest why combining tobacco with marijuana makes it more difficult to give up smoking marijuana.

(2)

....

....

....

....

(c) (i) Which of these drugs is a stimulant?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** alcohol

☒ **B** caffeine

☒ **C** LSD

☒ **D** morphine

(ii) Explain how stimulants affect reaction times.

(2)

....

....

....

....

(Total for Question 2 = 8 marks)

Blood glucose

3   Humans regulate the glucose concentration of their blood.

A scientist recorded the blood glucose concentration of an individual over a seven-hour period.

The results are shown in the table.

time of day	blood glucose concentration / mg per 100 cm^3
06.00	76
07.00	77
08.00	124
09.00	91
10.00	83
11.00	81
12.00	79
13.00	130

(a) (i)   Describe the trend in blood glucose concentration for this seven-hour period.

(2)

....

....

....

....

(ii) Suggest reasons for the changes in blood glucose concentration.

(2)

....

....

....

....

(iii) Complete the sentence by putting a cross (☒) in the box next to your answer.

Excess blood glucose is converted into

(1)

☒ **A** glucagon in the liver

☒ **B** glucagon in the pancreas

☒ **C** glycogen in the liver

☒ **D** glycogen in the pancreas

(b) (i) Scientists have discovered that a high body mass index (BMI) is a risk factor that may cause Type 2 diabetes.

Calculate the BMI for a female who has a mass of 67.5 kg and a height of 1.50 m.

$$BMI = \frac{\text{mass in kg}}{(\text{height in metres})^2}$$

(2)

answer = ...

(ii) Explain how a Type 2 diabetic can regulate their blood glucose concentration.

(3)

....

....

....

....

....

(Total for Question 3 = 10 marks)

Environment cycling

4 (a) The diagram shows the processes involved in the carbon cycle. Each process is numbered.

atmospheric carbon dioxide
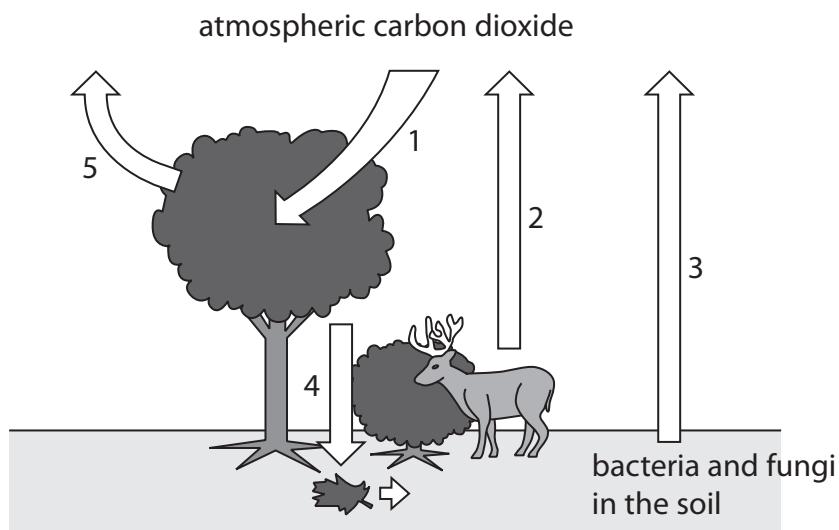
(i) What is the name of process 1?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** decomposition

☒ **B** denitrification

☒ **C** photosynthesis

☒ **D** respiration

(ii) Describe the numbered processes that return carbon dioxide back into the atmosphere.

(3)

....

....

....

....

....

....

(b) The human population is increasing.

Explain how this could change the concentration of carbon dioxide in the atmosphere.

(2)

....

....

....

....

(c) Air quality can be monitored using indicator species.

Name an indicator species used to monitor air quality.

(1)

....

(d) The overuse of fertilisers can cause eutrophication.

Explain the effects of eutrophication that may lead to the death of aquatic animals.

(3)

....

....

....

....

....

....

(Total for Question 4 = 10 marks)

Temperature regulation

5 (a) (i) Conditions in the human body must be regulated to maintain a stable internal environment.

Name the process that maintains a stable internal environment.

(1)

....

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

The temperature that enzymes work most effectively in the human body is

(1)

☒ **A** 31 °C

☒ **B** 33 °C

☒ **C** 35 °C

☒ **D** 37 °C

(b) Receptor cells in the skin detect temperature changes in the external environment.

Explain how this information is transmitted to the brain.

(4)

....

....

....

....

....

....

....

....

*(c) In the UK, the external temperature can drop below 0 °C.

Explain how the human body maintains a stable internal temperature when the external temperature is 0 °C.

(6)

....

....

....

....

....

....

....

....

....

....

....

....

(Total for Question 5 = 12 marks)

BLANK PAGE

Controlling infections

6 (a) Athlete's foot fungus is a pathogen.

(i) Describe how athlete's foot fungus is spread.

(1)

....

....

(ii) State the type of medication that can be used to treat this pathogen.

(1)

....

(b) The graphs show the effect of three different antibiotics on bacterial growth.

antibiotic A added

number of bacteria

time / days

antibiotic B added

number of bacteria

time / days

antibiotic C added

number of bacteria

time / days

no antibiotic added

number of bacteria

time / days
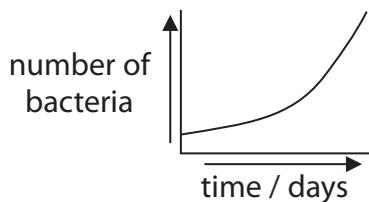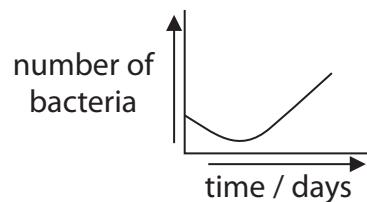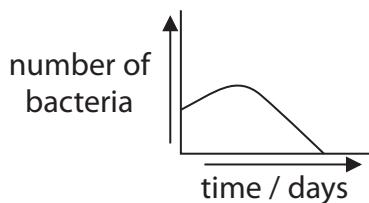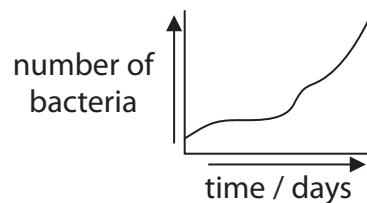
(i) Which of these is most effective at reducing the number of bacteria?

Put a cross (☒) in the box next to your answer.

(1)

☒ **A** antibiotic A

☒ **B** antibiotic B

☒ **C** antibiotic C

☒ **D** no antibiotic

(ii) Explain how chemical defence mechanisms in the body reduce the chance of infection.

(3)

....

....

....

....

....

*(c) MRSA is a bacterial infection.

The graph shows the number of cases of hospital patients with MRSA infections from 1993 to 2005.

number of
hospital
patients
with MRSA
infections
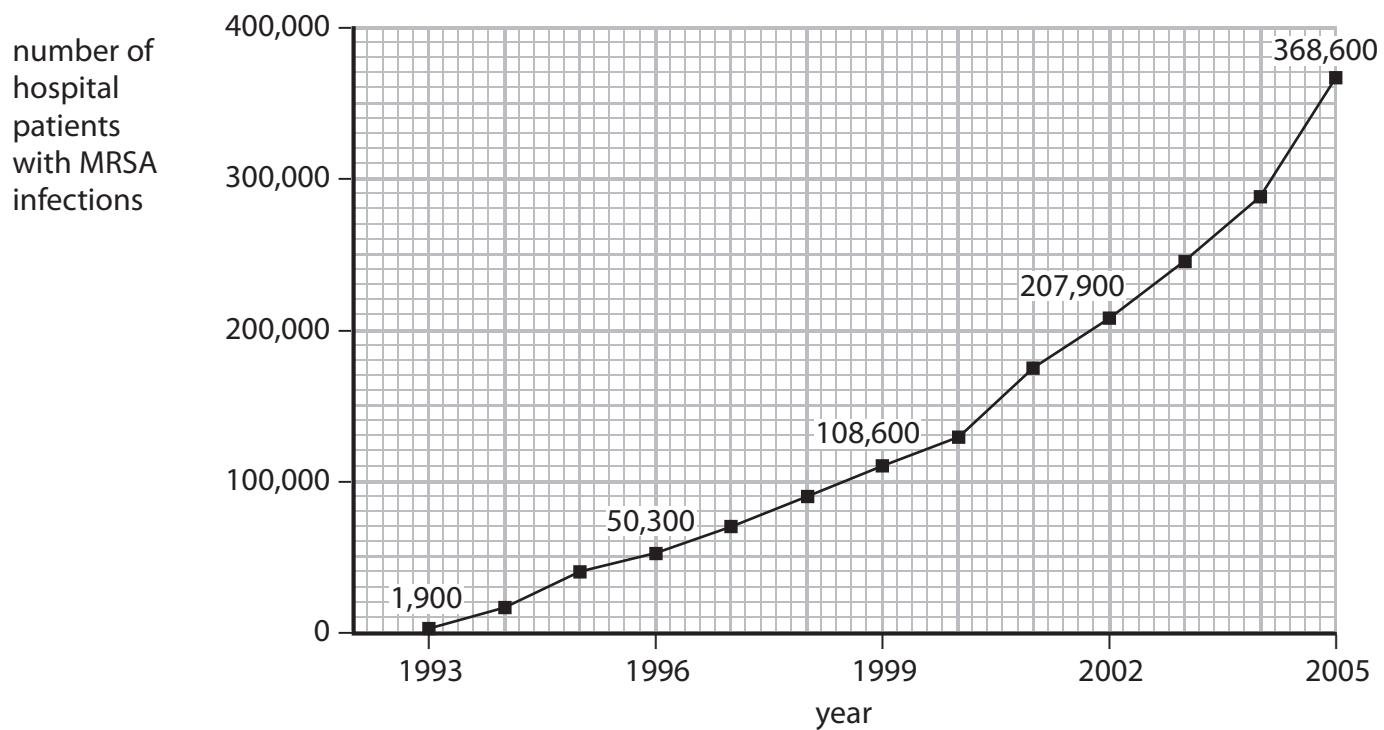
Explain the trend in the graph, even though the patients were treated with antibiotics.

(6)

....

....

....

....

....

....

....

....

....

....

....

....

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

BLANK PAGE

BLANK PAGE

BLANK PAGE