Edexcel GCSE

Centre Number

Candidate Number

Biology/Science
Unit B1: Influences on Life

Higher Tier

Thursday 1 March 2012 – Morning
Time: 1 hour

Paper Reference
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 ▶

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PEARSON

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 ☒.

Disease

1 (a) Smoking tobacco is the cause of 9 out of 10 cases of lung cancer.

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

The active compound in cigarette smoke that causes lung cancer is

(1)

☒ **A** carbon dioxide

☒ **B** carbon monoxide

☒ **C** nicotine

☒ **D** tar

(ii) One part of cigarette smoke acts on receptor sites in the brain.

Explain why it can be very difficult to give up smoking.

(2)

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(b) Smoking cigarettes can have an effect on reaction times.

State the group of drugs which increase the speed of reactions.

(1)

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(c) Cigarette smoke contains carbon monoxide.

Explain the effect of breathing in carbon monoxide on the function of the blood.

(3)

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(Total for Question 1 = 7 marks)

The nervous system

2   The diagrams show the structure of two neurones A and B.

muscle tissue

neurone A

skin tissue
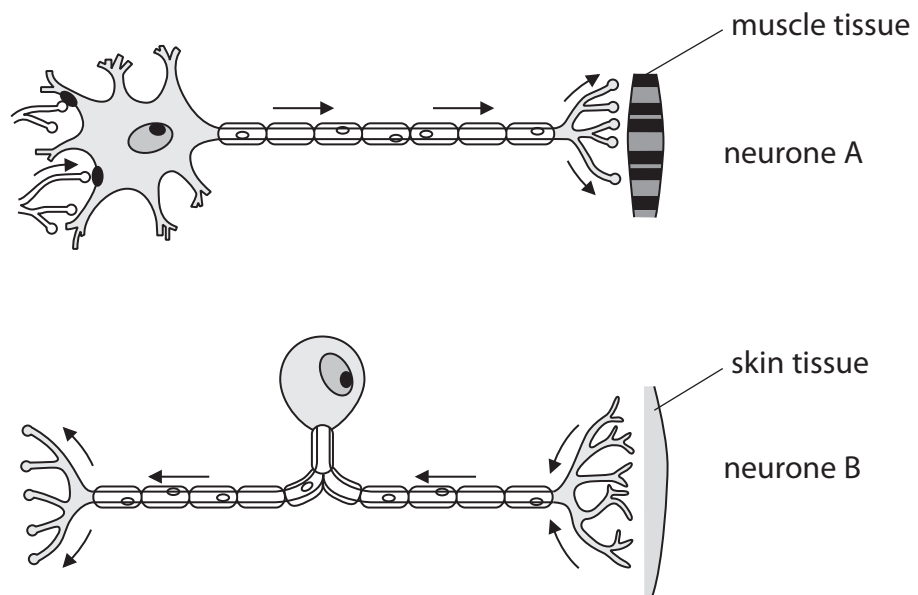
neurone B

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

(i)   Neurone A is a

(1)

☒ **A** motor neurone

☒ **B** reflex neurone

☒ **C** relay neurone

☒ **D** sensory neurone

(ii)   Neurone B sends information to the

(1)

☒ **A** brain and spinal cord

☒ **B** hormones which results in a response

☒ **C** muscle tissue

☒ **D** receptor cells in the skin

(b) Explain how information travels along the axon of a sensory neurone.

(2)

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(c) Describe the role of the myelin sheath.

(2)

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(d) Describe the pathway of a nerve impulse through a reflex arc.

(3)

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(Total for Question 2 = 9 marks)

Variation

3 (a) The graph shows the variation in eye colour in a human population.

number of individuals (y-axis, 0 to 30)

eye colour (x-axis: blue, brown, green, grey, hazel)
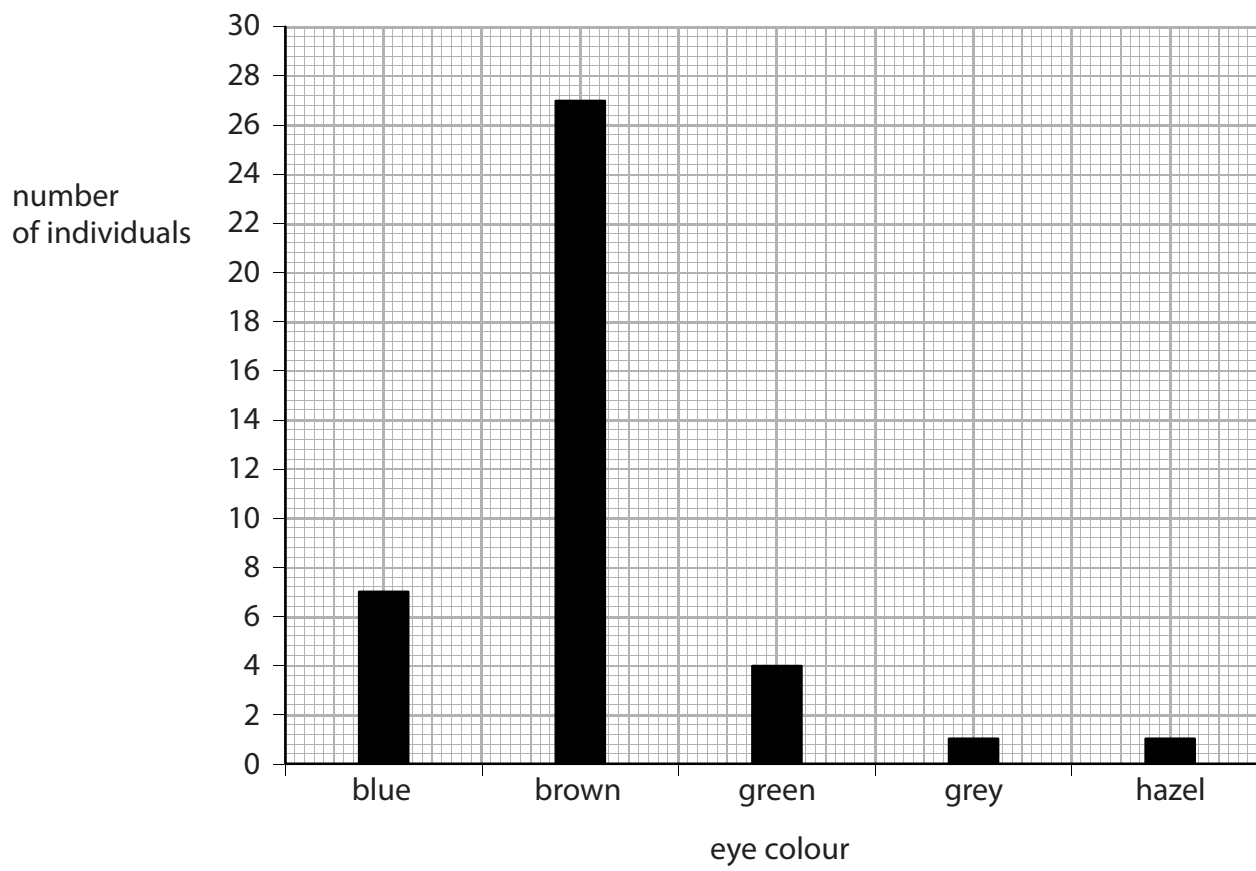
(i) How many individuals had their eye colour recorded in this human population?

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

(1)

☒ **A** 7

☒ **B** 27

☒ **C** 30

☒ **D** 40

(ii) Calculate the percentage of individuals with brown eyes in this human population.

(2)

answer = ...%

(b) An individual's eye colour is determined by the alleles they inherit from their parents.

A female parent with the genotype **(bb)** had blue eyes and a male parent with the genotype **(Bb)** had brown eyes.

(i) Complete the Punnett square to show the gametes of the parents and the genotypes of the offspring.

(2)

Female gametes

Male gametes
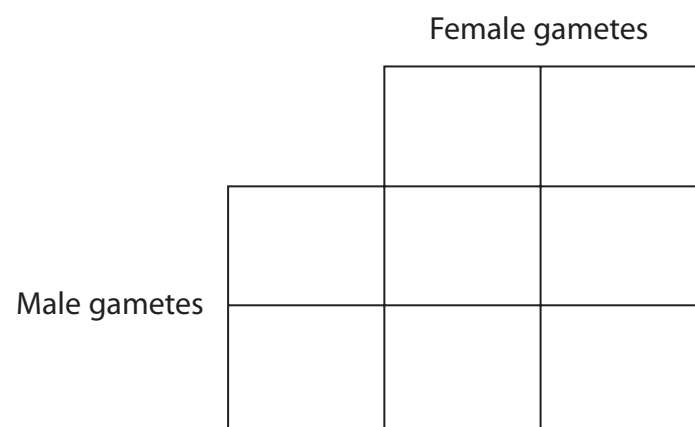
(ii) If these two parents have one child, state the probability that this child would have blue eyes.

(1)

....

(iii) Give the genetic term that describes the genotype **(bb)**.

(1)

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(c) Variation may arise due to the geographic isolation of a species.

Explain how geographic isolation of members of one species can lead to a new species evolving.

(3)

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(Total for Question 3 = 10 marks)

Environmental recycling

4 (a) Plant A was grown in soil with a low concentration of nitrates.
Plant B was grown in soil with a high concentration of nitrates.

Andrew measured the width of a leaf from each of the plants.

7.6 cm

11.8 cm
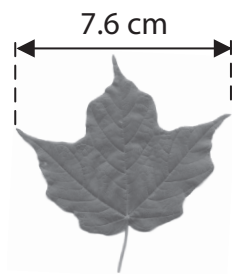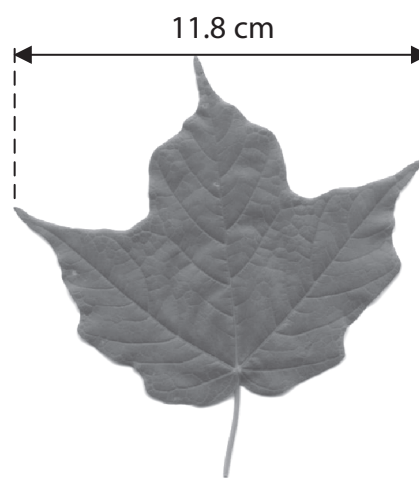
leaf from plant A   leaf from plant B

(i) Andrew removed two more of the leaves from each of the plants and
measured their width.

The results are shown in the table.

plant	leaf width / cm			
	1	2	3	mean
A	7.6	7.3	7.0	7.3
B	11.8	10.3	11.2	

Calculate the mean leaf width for plant B.

(2)

answer = ...cm

(ii) Explain the differences in the mean width of the leaves from plant A and plant B.

(2)

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

Plants use nitrates to make

(1)

☒ **A** carbohydrates

☒ **B** fats

☒ **C** phosphates

☒ **D** proteins

(c) Explain how different types of bacteria act to increase nitrate concentration in the soil.

(4)

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(d) Name the process by which bacteria release carbon dioxide into the atmosphere.

(1)

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(Total for Question 4 = 10 marks)

Classification

5 (a) Tigers are classified as vertebrates.
   The binomial name for the tiger is *Panthera tigris*.

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

   The word *Panthera* in the tiger's binomial name refers to its

   (1)

   ☒ **A** class

   ☒ **B** genus

   ☒ **C** order

   ☒ **D** species

   (ii) State the phylum that includes mammals such as tigers.

   (1)

   ....

   (b) Bacteria are classified as prokaryotes.

   State **two** characteristics of prokaryotes.

   (2)

1 ....

....

2 ....

....

(c) Explain why it is difficult to classify some living organisms.

(2)

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*(d) Describe how scientists classify vertebrates into different groups.

(6)

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(Total for Question 5 = 12 marks)

Diabetes

6 (a) In the UK, there has been an increase in the percentage of the population with type 2 diabetes.

percentage of population with type 2 diabetes (%)

years
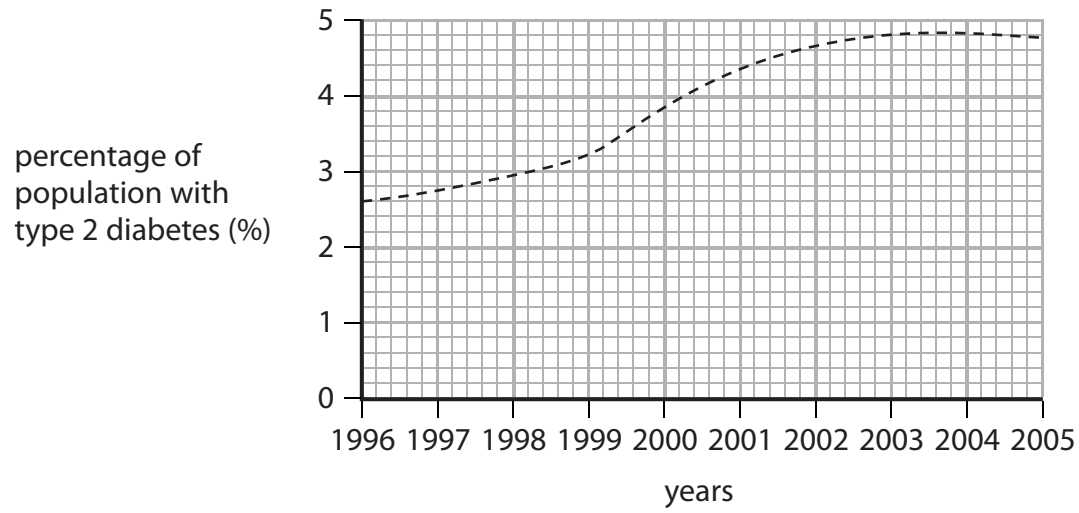
(i) The population of the UK between 1996 and 2005 was 60 million.

Calculate the increase in the number of people with type 2 diabetes between 1996 to 2005.

(2)

answer = ... people

(ii) Suggest **two** reasons for this increase in the number of people with type 2 diabetes.

(2)

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(b) Explain how type 2 diabetes can be controlled without the use of drugs.

(2)

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*(c) Explain how blood glucose levels are controlled in people who do **not** have
diabetes.

(6)

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(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

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