

Candidate Name	Centre Number	Candidate Number

WELSH JOINT EDUCATION COMMITTEE
General Certificate of Secondary Education



CYD-BWYLLGOR ADDYSG CYMRU
Tystysgrif Gyffredinol Addysg Uwchradd

235/01

SCIENCE

FOUNDATION TIER (Grades G-C)

BIOLOGY 1

A. M. WEDNESDAY, 20 June 2007

(45 minutes)

For Examiner's use only	
Total Marks	

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator.

INSTRUCTIONS TO CANDIDATES

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

INFORMATION FOR CANDIDATES

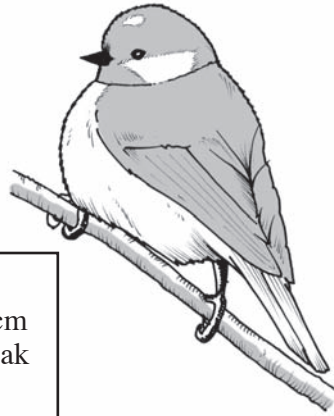
The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

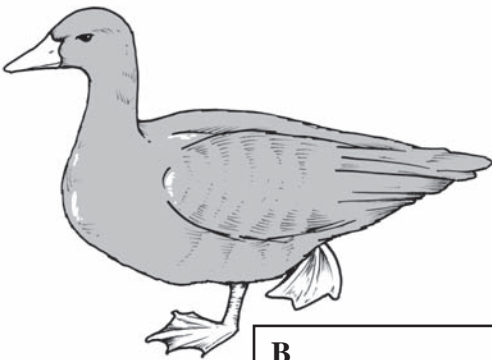
No certificate will be awarded to a candidate detected in any unfair practice during the examination.

Answer all questions.

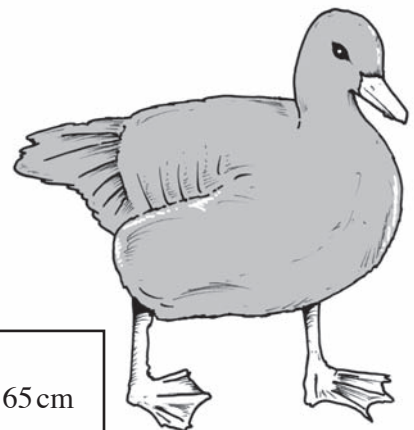
1. The drawings show some birds we see in Wales. Use the information to answer the questions which follow.



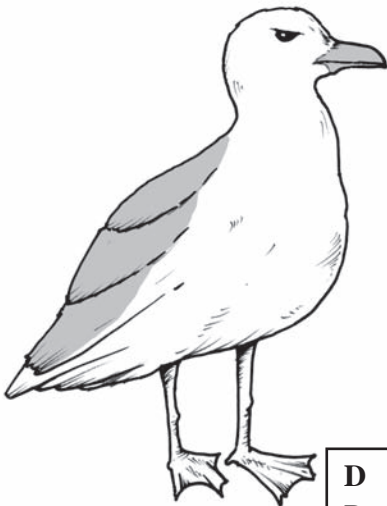
A
Body length 15 cm
Short pointed beak
Grasping feet



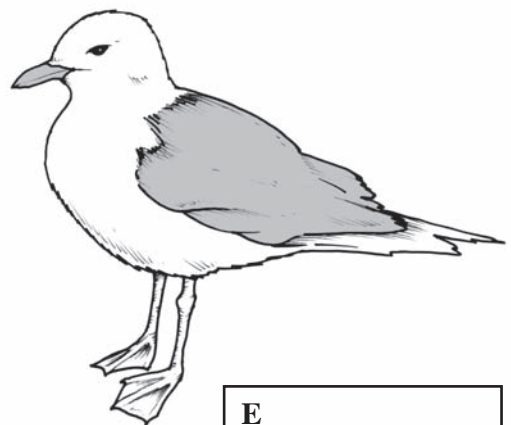
B
Body length 80 cm
Long beak
Webbed feet



C
Body length 65 cm
Long beak
Webbed feet



D
Body length 55 cm
Long beak
Webbed feet



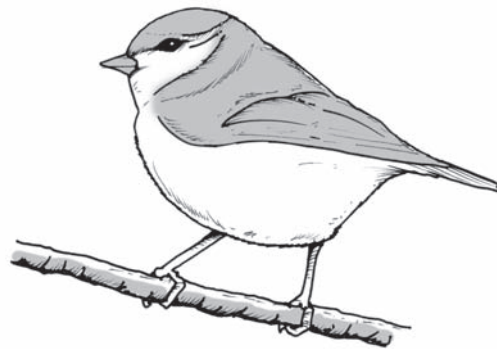
E
Body length 40 cm
Long beak
Webbed feet

(a) (i) Write letters **A-E** in the table to put the birds into groups.

<i>Scientific Bird group</i>	<i>Features</i>	<i>Examples (A-E)</i>
<i>Parus</i>	Body length between 10-20 cm Grasping feet Patterned head Short beak	
<i>Larus</i>	Body length between 40-70 cm Webbed feet White head Long beak	
<i>Anser</i>	Body length between 65-80 cm Webbed feet Grey head Long beak	

[5]

The drawing below shows a bird seen in gardens.



English Common name *Blue tit*
Body length 12 cm

(ii) Using the drawing and table, state the name of the bird group to which the bird belongs. [1]

.....

(iii) Scientists wrote a book about this bird in many different languages. Suggest a reason why they used its scientific name and not a common name. [1]

.....

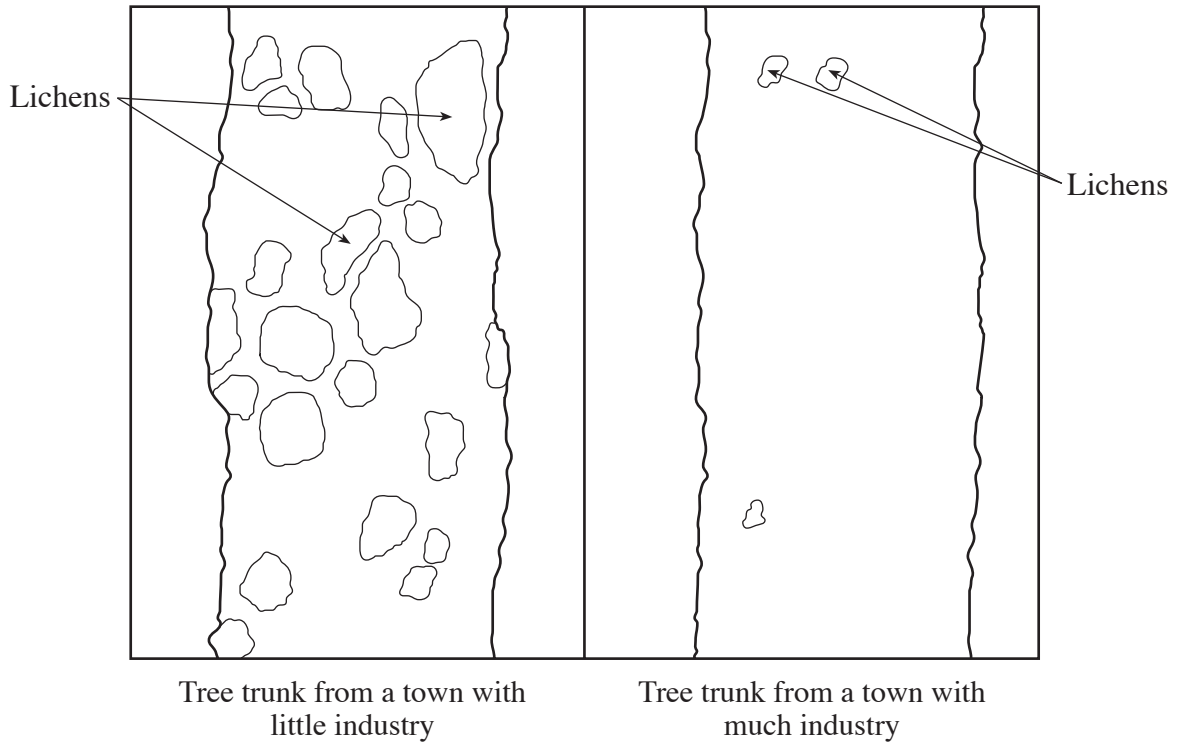
(b) (i) Birds **B**, **C**, **D** and **E** live in and near water. Give one feature they all have, which helps them to move in water. [1]

.....

(ii) Explain how this feature is helpful. [1]

.....

2. The diagrams show tree trunks from two towns. Each has patches of small plants called Lichens growing on it.



- (a) Study the diagrams, then complete the sentences below by selecting the correct words from the list. [3]

high, polluted, low, unpolluted, air.

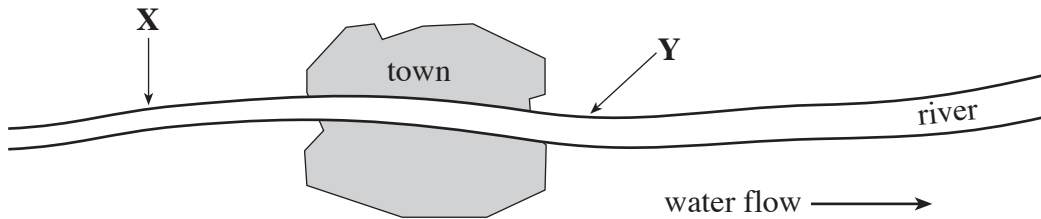
Lichens are useful when scientists are studying pollution.

When there are large amounts of lichens, pollution levels are

Very small amounts of lichens show that an area is

- (b) Bloodworms are often found in lakes and rivers. They multiply in water which has a low oxygen content.

The map shows a small river which runs through a town. Scientists took two water samples of equal volume from the river. They counted the number of bloodworms in each sample.



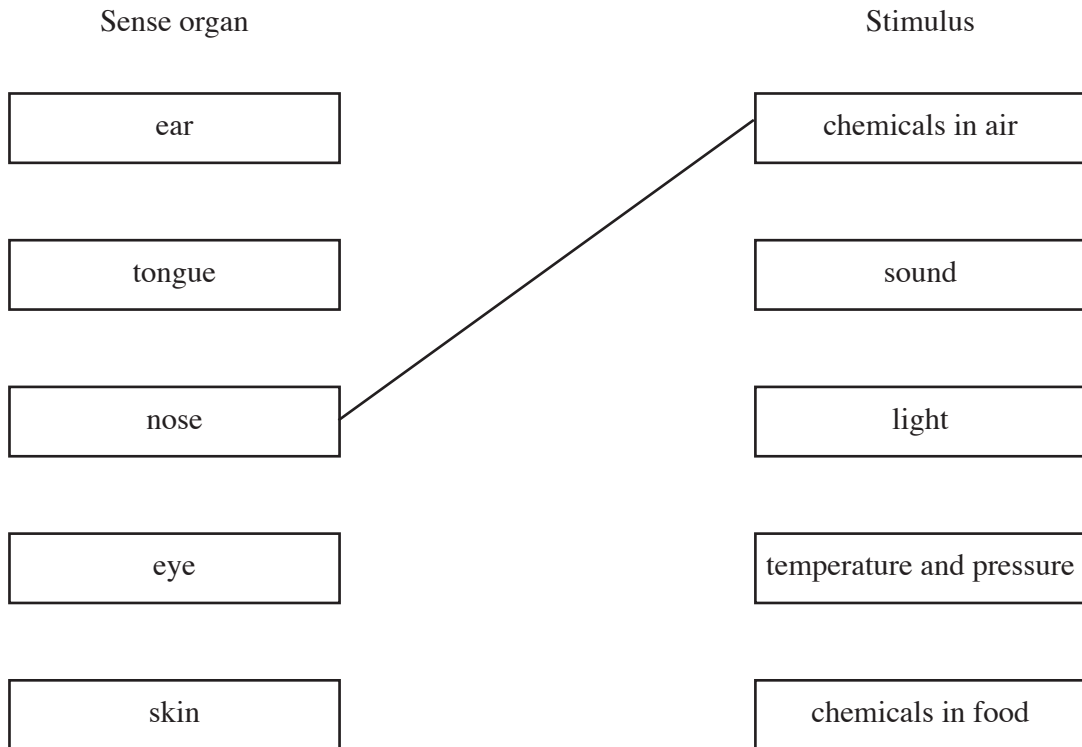
<i>Sample point</i>	<i>Number of bloodworms in sample</i>
X	100
Y	1000

Complete the statement below by underlining the correct ending.

As the river flows through the town from **X** to **Y** the oxygen content of the water [1]

increases. decreases. stays the same.

3. (a) Complete the chart below on human senses.
Draw a line to connect each sense organ with its stimulus. One has been done for you.



[2]

- (b) Complete the following statements by filling in the blank spaces using some of these words:

brain, impulse, electrical, nerves, reactions.

When a sense organ receives a stimulus from the environment, information is passed to the The information travels through as a nerve which is in the form of signals.

[4]

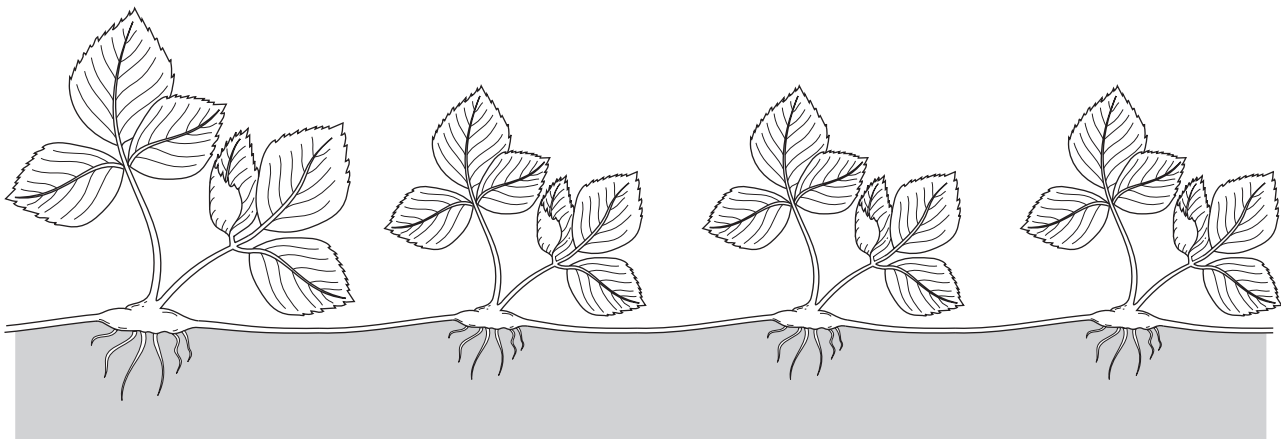
4. Read the short passage below and answer the questions which follow.

Supermarket Strawberries

Many farmers grow large amounts of strawberries for supermarkets. The strawberries must all have the same features. They must be medium sized, bright red and sweet tasting.

One strawberry parent plant can multiply by asexual reproduction to give many new plants which are all identical. They produce strawberries which all have exactly the same features.

The same parent plant can be used many times. The new plants are genetically identical.



Parent plant

Identical new plants

- (a) Why are strawberry plants which grow in this way useful to farmers? [1]

.....

- (b) Give **two** features of strawberries which would be required by supermarkets. [1]

.....

- (c) (i) What is the correct scientific term for a group of genetically identical plants. [1]

.....

- (ii) State **one** difference between *asexual* and *sexual* reproduction. [1]

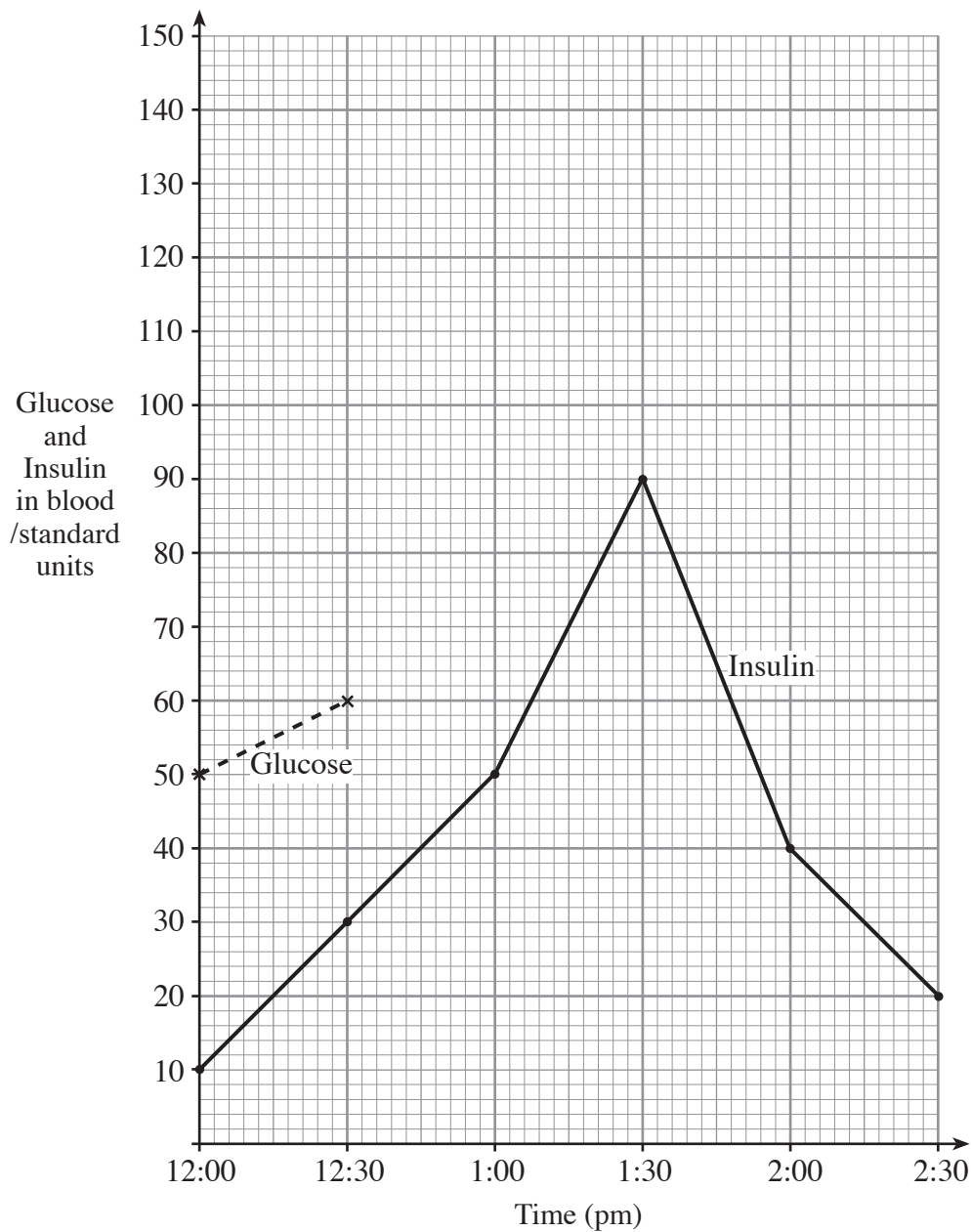
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5. In the human body, *insulin* controls the level of sugar (glucose) in the blood.

The levels of insulin and glucose in Rehana's blood were measured during an investigation which started at lunchtime.

Rehana is not diabetic and eats lunch. The results are shown in the table and on the graph.

<i>Time (pm)</i>	<i>Glucose in blood /standard units</i>
12.00	50
12.30	60
1.00	140
1.30	120
2.00	60
2.30	50



(a) The results for insulin have been plotted as a graph.
Plot the results for glucose onto the same graph. Join the points with a ruler. The first two points have been done for you. [3]

(b) From the graph

(i) How much insulin is in the blood at 1.45 pm? [1]

.....

(ii) Suggest a possible reason for the increase in glucose in Rehana's blood between 12.00 pm and 1.00 pm. [1]

.....

(iii) Rehana rests after 12.00 pm. State what has caused the decrease in glucose between 1.00 pm and 1.30 pm. [1]

.....

(c) Matt has diabetes. His body does not produce enough insulin.

Draw a line on the graph to show the expected level of glucose in Matt's blood from lunchtime, 12.00 to 2.30 pm, if he does **not** take an insulin injection. **Label the line Matt.** [1]

6. (a) The table gives information about foods.
Answer the questions using this information only.

Information from labels on snack foods

<i>Snack foods (per 100g)</i>			
	<i>salted bites</i>	<i>mini-toasties</i>	<i>fruiti-museli bar</i>
Energy (kJ)	1430.0	1550.0	1200.0
Salt (g)	3.0	0.8	0.2
Fibre (g)	4.0	3.4	14.0

- (i) Alun is a student. He wants to lose weight.
Which of the snacks in the table would be best for him? Give a reason for your choice. [2]

Snack

Reason

- (ii) Salt is often added to processed foods. Eating too much salt can be harmful to young children.

Which of the snacks should not be given to nursery school pupils?
Give a reason for your answer. [2]

Snack

Reason

- (b) The table below shows how much energy we use in two activities.

<i>Activity</i>	<i>Energy used per hour kJ hr⁻¹</i>
Dancing	1000
Swimming	2000

Katy eats food with 4000 kJ of energy and, later in the day, goes swimming.
How long must she swim to use up the energy in the food? [1]

Answer

7. During the last 10 years ‘DNA or genetic fingerprinting’ has been increasingly used to prove innocence or guilt in criminal cases. The chart below shows five ‘DNA fingerprints’ produced as evidence in a murder case. It shows the ‘DNA fingerprints’ taken from the victim’s blood and from a blood specimen found at the crime scene. It also shows the ‘DNA fingerprints’ taken from the blood of three suspects.



- (a) (i) Which of the three suspects was eventually convicted of the crime? [1]

.....

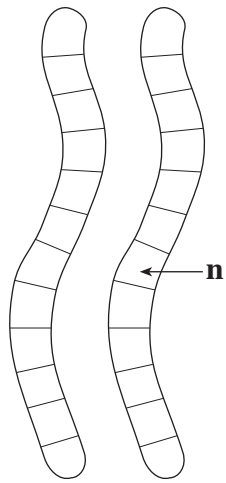
- (ii) Explain your answer. [2]

.....
.....
.....

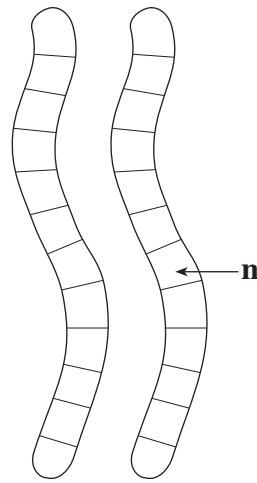
- (b) Two of the suspects in this case were innocent of the crime but their ‘DNA fingerprints’ will not be destroyed by the authorities and will be kept on a DNA database. Suggest **one** ethical issue arising from keeping such records. [1]

.....
.....

8. The diagram below shows the chromosome pair number 7 from John and Claire both of whom are heterozygous for the cystic fibrosis gene. The allele for cystic fibrosis (**n**) is recessive to the normal allele (**N**).



John's chromosomes



Claire's chromosomes

- (a) Complete the diagram above by **carefully** adding the letter for the normal gene for both John and Claire. [2]
- (b) (i) John and Claire are married. Complete the Punnett square below to show which alleles John and Claire's children may inherit. [2]

	Claire	
	<i>gametes</i>	
John		

- (ii) In this cross, what is the chance of a child being born with cystic fibrosis? [1]

Put a **circle** around the correct answer.

10% 25% 50% 100%

- (c) (i) Gene therapy is used in the treatment of cystic fibrosis. Explain how the gene is given to the patient. [1]

.....

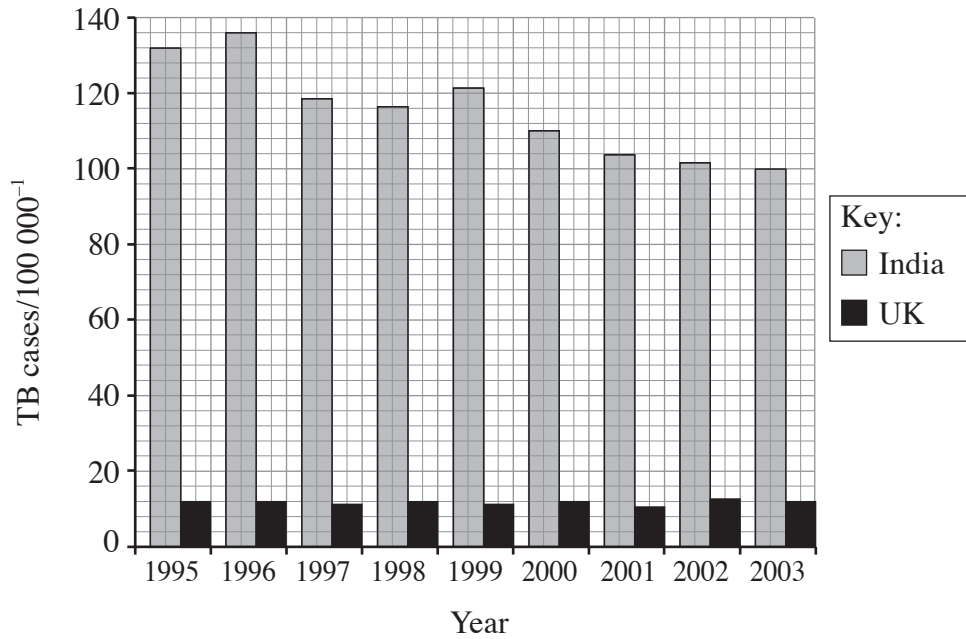
- (ii) State **one** of the problems that is encountered when using gene therapy to treat disease. [1]

.....

.....

9. Tuberculosis (TB) is an infectious disease caused by bacteria. The bacteria are passed from one person to another in airborne droplets which are coughed into the air by a patient.

The chart below shows the number of cases of TB, **per 100 000 of the population**, in India and the United Kingdom between 1995 and 2003.



- (a) What is the **trend** in the number of reported cases of TB in
- (i) India; [1]
-
-
- (ii) the UK? [1]
-
-
- (b) Suggest **one** reason why the number of cases of TB, per 100 000 of the population, is higher in India than the UK. [1]
-
- (c) State **one** way in which the number of cases of TB in India could be reduced. [1]
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