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|-------------|---------------|------------------|
| Surname | Centre Number | Candidate Number |
| Other Names | | 0 |



GCSE

0235/01

**SCIENCE
FOUNDATION TIER
BIOLOGY 1**

A.M. MONDAY, 28 January 2013

45 minutes

| For Examiner's use only | | |
|-------------------------|--------------|--------------|
| Question | Maximum Mark | Mark Awarded |
| 1 | 7 | |
| 2 | 5 | |
| 3 | 6 | |
| 4 | 6 | |
| 5 | 5 | |
| 6 | 6 | |
| 7 | 6 | |
| 8 | 6 | |
| 9 | 3 | |
| TOTAL | 50 | |

ADDITIONAL MATERIALS

In addition to this paper you may require a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

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.

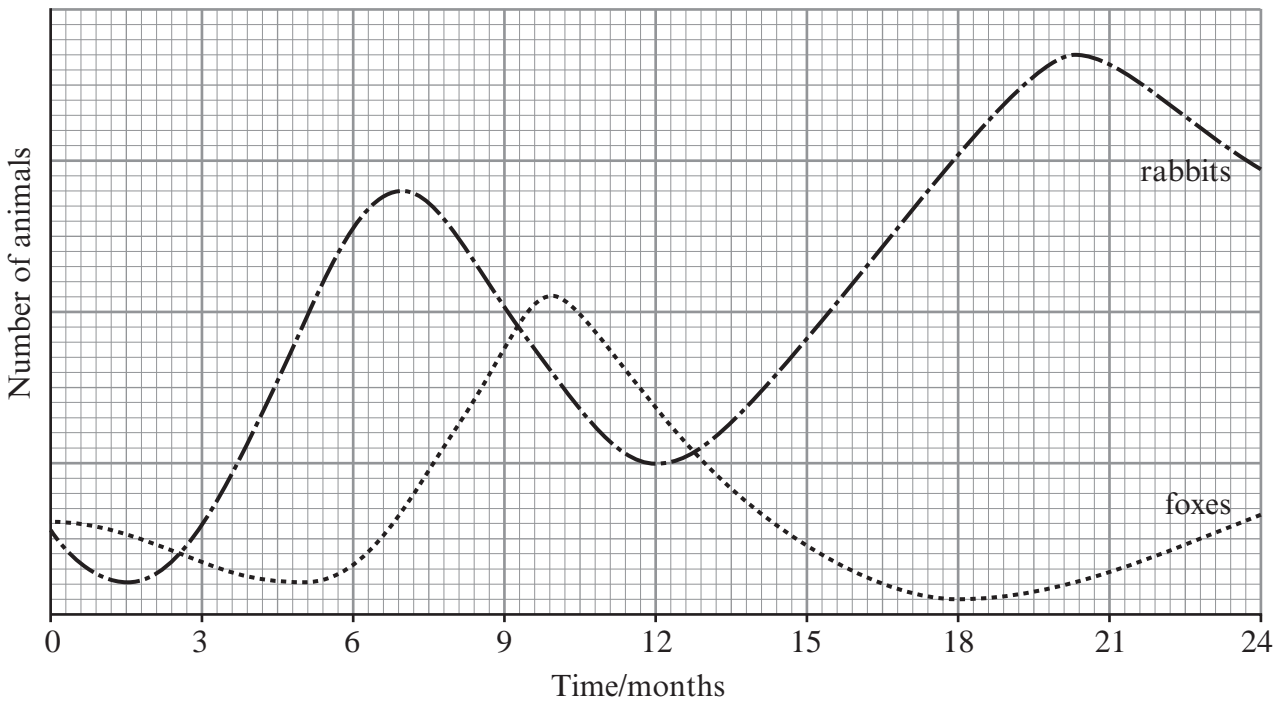
INFORMATION FOR CANDIDATES

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.

Answer **all** questions.

1. Predation is important in controlling the number of animals.
The graph below shows the numbers of foxes and rabbits in one area over two years.
The foxes eat rabbits.



- (a) Name the predator and the prey in this example. [1]

predator prey

- (b) Using the graph,

- (i) State the time when rabbit numbers were lowest [1]

..... months

- (ii) What happened to the number of rabbits when the number of foxes was at its lowest? Suggest an explanation. [2]

Answer

Explanation

- (c) State **one** reason for rabbit numbers decreasing naturally, other than predation. [1]

.....

(d) The photographs below show two rabbits.

Rabbit from a woodland in Wales



Rabbit A



©Dannay/Shutterstock

From the photographs above, state a body feature which would make it difficult for rabbit A to survive in the wild. Give a reason for your answer. [2]

Feature

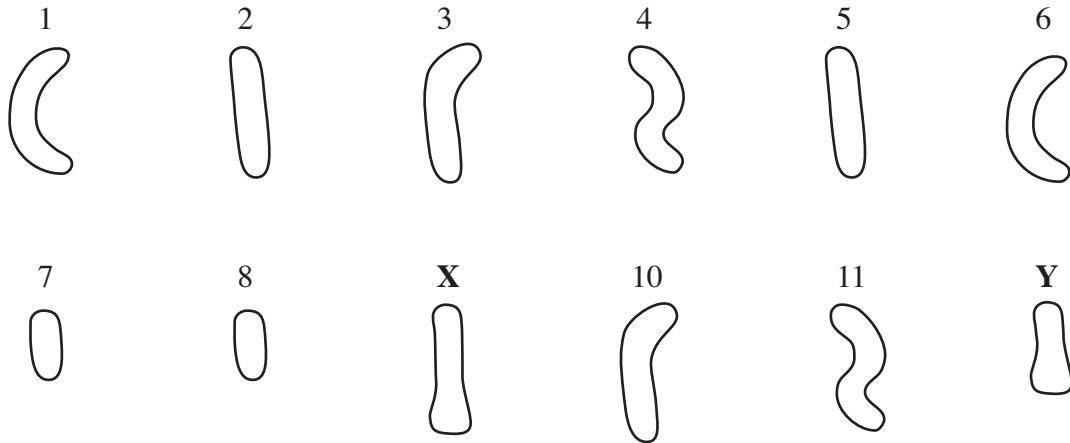
Reason

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2. The diagram below shows all the chromosomes in a body cell of an animal.



(a) Using the numbers in the diagram above, match up the pairs of chromosomes. The first one has been done for you. [1]

1 matches with 6

2 matches with

3 matches with

4 matches with

(b) The two chromosomes marked X and Y are the sex chromosomes. State whether the cell is from a male or female. [1]

.....

(c) There are 12 chromosomes in this body cell. How many chromosomes will there be in a sex cell (gamete) of this animal? [1]

.....

(d) Name the structures which are found arranged along each chromosome. [1]

.....

(e) Name the chemical that chromosomes are made from. [1]

.....

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3. Read the following information.



©Eduardo Rivero

A monkey is shown in the photograph above. Monkeys are closely related to humans. Two groups of scientists discussed the use of monkeys in laboratory work.

| Scientists in group 1 said:- | Scientists in group 2 said:- |
|--|---|
| <ul style="list-style-type: none"> • It is essential to use monkeys in testing new drugs. • New drugs for strokes, AIDS, kidney failure and other human disease have been developed. • In future, there should be far fewer tests on monkeys. | <ul style="list-style-type: none"> • Tests cause monkeys distress and should be avoided. • The number of tests on monkeys should be reduced as soon as possible. • The tests could be done using tissue cultures or computers. |

From *New Scientist* June 2006

Answer the following questions using **this information only**.

(a) (i) For what purpose do group 1 scientists say they need to use monkeys? [1]

.....

(ii) Give **two** human diseases which can now be treated. [1]

1

2

(b) (i) State **one** reason given by the group 2 scientists for **not** using monkeys. [1]

.....

.....

(ii) State **two** alternative methods for testing drugs that could be carried out without using monkeys. [1]

1

2

(c) Suggest **one** reason why people may worry more about using monkeys in experiments rather than other animals. [1]

.....
.....

(d) Give **one** example where both groups of scientists were in agreement. [1]

.....
.....

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4. The table below shows the content of three drinks and their use in the body.

| Content | Use in the body | whole milk (500 cm ³) | skimmed milk (500 cm ³) | fruit juice (500 cm ³) |
|--|-------------------------------|--------------------------------------|--|---------------------------------------|
| Energy value (kJ) | | 1315 | 1045 | 513 |
| Protein (g) | Builds and repairs organs | 16 | 18 | 3 |
| Carbohydrate (mainly sugars) (g) | Provide energy | 23.5 | 24.0 | 40.0 |
| Fat (g) | Energy store | 18.0 | 5.5 | 0.0 |
| Calcium (mg) | Healthy bones and teeth | 335 | 350 | 0 |

Use the information **in the table** to answer the following questions.

- (a) (i) How much more energy is there in 500 cm³ of whole milk than in 500 cm³ of skimmed milk? [1]

Answer kJ

- (ii) A carton of **whole** milk contains 1000 cm³. How much energy is contained in the carton? [1]

Answer kJ

- (b) Whole milk is changed into skimmed milk by a process called skimming.

- (i) What is removed when the milk is skimmed? [1]

.....

- (ii) What type of milk should a person choose in order to lose weight? [1]

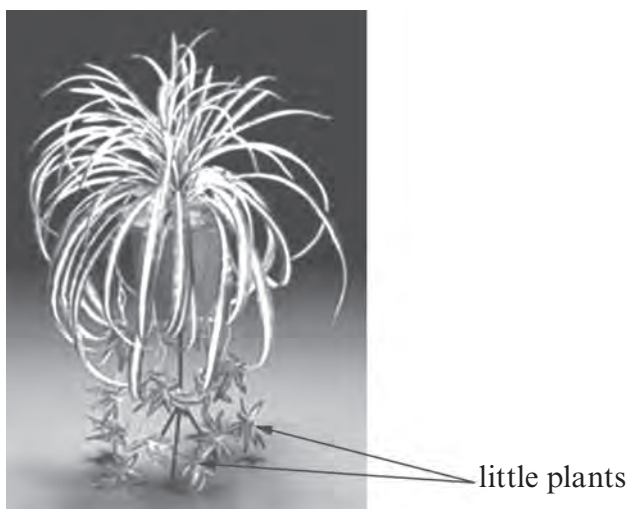
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- (c) Give **two** reasons why a dentist suggests you should drink milk instead of fruit juice. [2]

- (i)

- (ii)

5. A spider plant grows little plants on shoots as shown in the photograph below.



The little plants were cut off and put into soil.
They grew into new spider plants.

- (a) What type of reproduction is used to produce the little spider plants? [1]

.....

- (b) All the plants are genetically identical.
What are genetically identical organisms called? [1]

.....

- (c) A new variety of spider plant was produced because of a change in the genes.
What name is used to describe this change? [1]

.....

- (d) Name **one** factor in the environment which causes genes to change. [1]

.....

- (e) The Latin name for the spider plant is *Chlorophytum comosum*. Why do animals and plants have Latin names as well as their common names? [1]
Underline the correct answer below.

- (i) The common name is the same all over the world.
(ii) The Latin name is the same all over the world.

6. When Gareth heard a sudden loud noise, he jumped up out of his seat.

His response was a reflex action.

(a) State **two** features of a reflex action. [2]

(i)

(ii)

(b) (i) Fill in the blanks by using some of the words below. [3]

eyes sound ears light receptors

The stimulus in Gareth's reflex was

The stimulus was detected by in Gareth's

.....

(ii) In what form is the information transferred to the brain? [1]

.....

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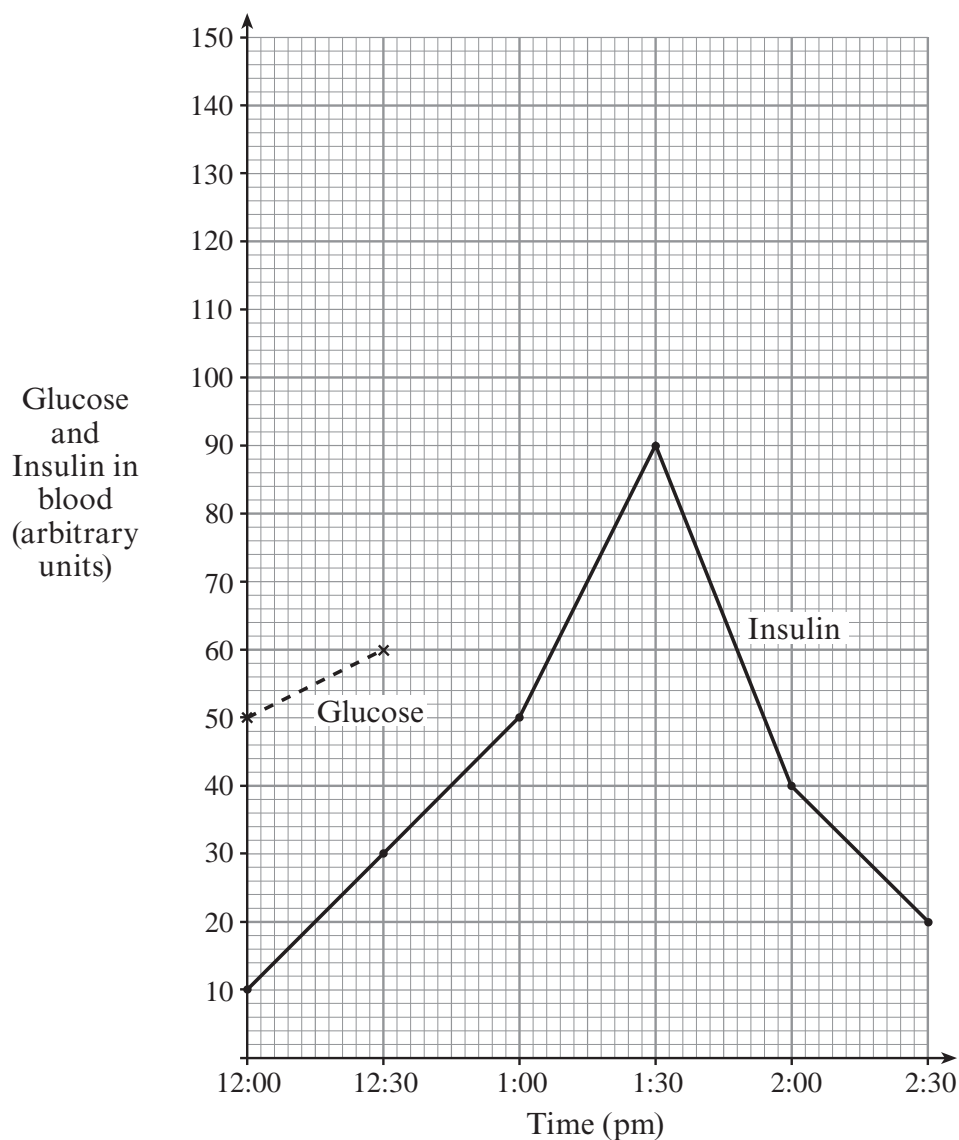
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7. In the human body, *insulin* controls the levels of sugar (glucose) in the blood.

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.

| Time (pm) | Glucose in blood (arbitrary units) |
|-----------|------------------------------------|
| 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 opposite.
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]

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8. Gregor Mendel made important discoveries on how characteristics or traits are passed from parents to offspring.
In one of his experiments he crossed pea plants that produced seeds with round coats with plants that produced seeds with wrinkled coats.

Seeds with
wrinkled coats



Seeds with
round coats

R. W. Van Norman/Visuals Unlimited, Inc

The results of this cross were plants (F1) that only produced round coated seeds. Mendel explained this by saying that pea plants passed on **factors** (alleles) from one generation to the next. He also said that the factor for round seeds is dominant over the factor for wrinkled seeds.

Use the information in the passage and your knowledge to answer the following questions.

- (a) (i) Complete the following to show how the F1 plants were produced in Mendel's experiment.

R = allele for round seeds
r = allele for wrinkled seeds

Phenotype of parents

Round

×

Wrinkled

Genotype of parents

RR

rr



Gametes

.....

.....

[1]

- (ii) Complete the Punnett square to show the genotypes produced in this cross. [2]

| | | | |
|-----------|----------------|--|--|
| | <i>Gametes</i> | | |
| | | | |
| F1 | | | |
| | | | |

- (b) (i) Mendel then crossed two of these F1 plants together. Draw your own Punnett square and complete it to show the genotypes of the offspring that would be produced. [2]

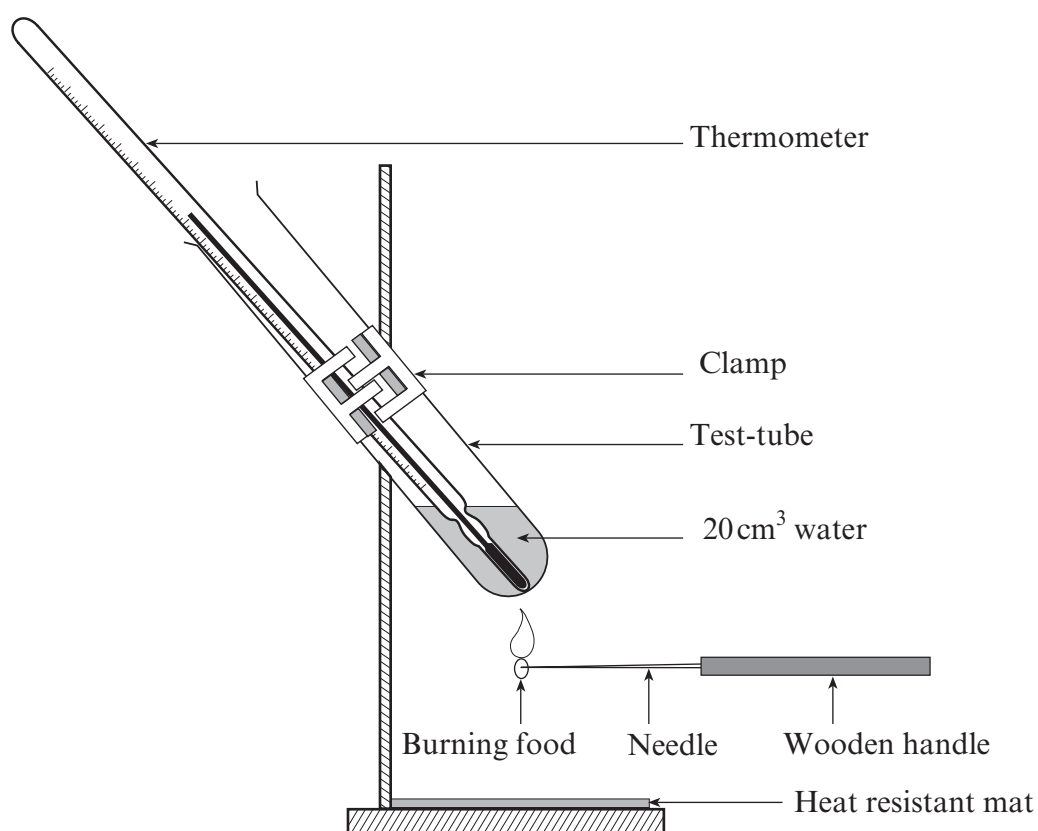
- (ii) What is the ratio of round to wrinkled seeds produced above? [1]

..... round: wrinkled

Examiner
only

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9. The following apparatus was set up to measure the energy content of a piece of food.



- (a) State **two** measurements that you must take in order to find the energy content of the food. [2]

.....

.....

- (b) If you were comparing the energy content of two **different** foods state **one other** measurement that must be taken. [1]

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END OF PAPER