

Write your name here

Surname

Other names

Pearson
Edexcel GCSE

Centre Number

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Candidate Number

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Biology/Science
Unit B1: Influences on Life

Higher Tier

Tuesday 13 May 2014 – 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) The photograph shows a housefly.



(i) Houseflies can be the animal vector for the disease dysentery.

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

The disease dysentery is caused by a

(1)

- A** bacterium
- B** fungus
- C** protozoan
- D** virus

(ii) Describe how a housefly can cause a person to become infected with dysentery.

(2)

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(iii) Explain how a chemical defence mechanism of the human body can reduce the chance of dysentery.

(3)

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(b) Explain how the *Anopheles* mosquito can spread the disease malaria.

(2)

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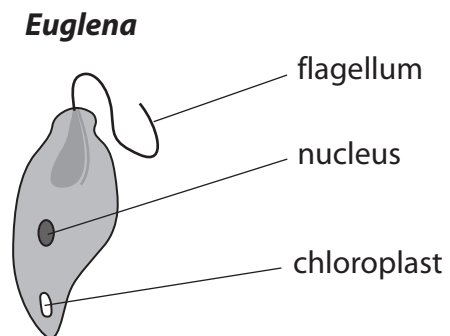
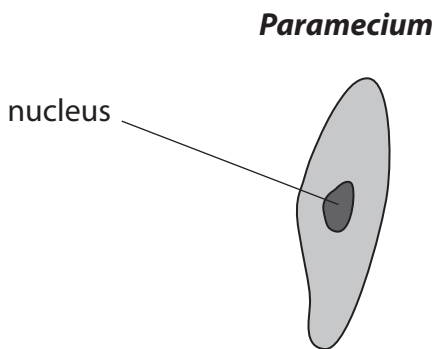
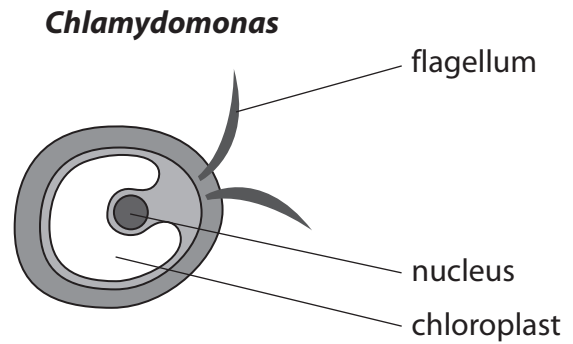
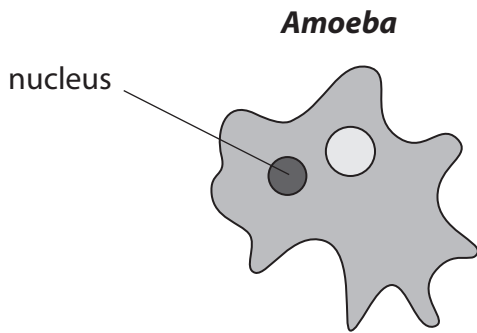
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(Total for Question 1 = 8 marks)



Classification

2 (a) All the organisms in the diagram belong to one Kingdom.



(i) Which Kingdom do these organisms belong to?

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

(1)

- A Animalia
- B Fungi
- C Protocista
- D Prokaryotes

(ii) In which structure are the chromosomes of these organisms found?

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

(1)

- A cilia
- B chloroplast
- C flagellum
- D nucleus



(iii) Suggest **one** reason why both *Euglena* and *Chlamydomonas* could be placed into the Kingdom Plantae.

(1)

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(b) (i) *Euglena* is unusual because it is both heterotrophic and autotrophic.

Explain how this helps *Euglena* to survive.

(3)

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(ii) A scientist discovered a new species of *Euglena* in boiling acidic mud in Costa Rica.

Explain how this discovery could be validated by the scientific community.

(2)

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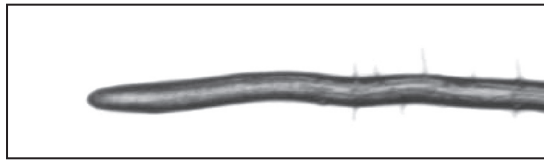
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(Total for Question 2 = 8 marks)



Plant growth substances

- 3 Photograph **A** shows the root of a plant when it was positioned horizontally. The root was kept in the dark and left in this position. Photograph **B** was taken three days later.



photograph **A**



photograph **B**

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

The process that resulted in the type of root growth shown in photograph **B** is

(1)

- A** negative gravitropism
- B** negative phototropism
- C** positive gravitropism
- D** positive phototropism

- (ii) Explain how this change in root growth has occurred.

(3)

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(iii) Suggest the advantages to the plant of this response.

(2)

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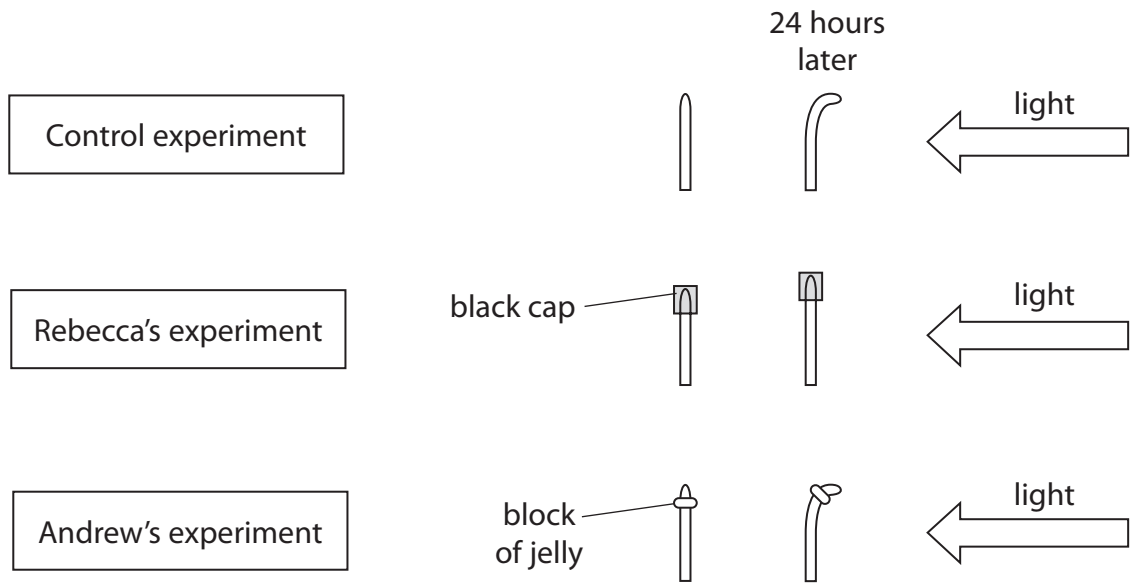
(b) Rebecca and Andrew each set up an experiment to investigate the effect of light on plant shoots.

They also set up a control experiment.

Rebecca placed a black cap over the tip of her plant shoot.

Andrew removed the tip from his plant shoot, placed a thin block of jelly on top of the plant shoot and then replaced the tip.

All three experiments were left for 24 hours.



(i) Suggest why Rebecca and Andrew set up a control experiment.

(1)

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(ii) Explain the results of Rebecca's experiment and Andrew's experiment.

(3)

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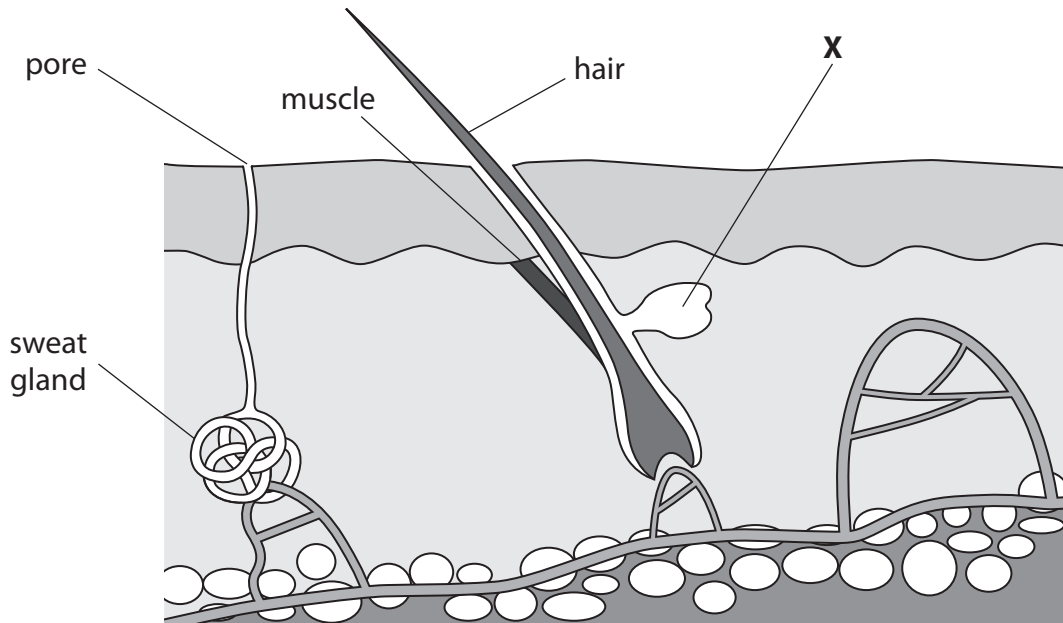
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(Total for Question 3 = 10 marks)



The skin

4 (a) The diagram shows a cross section through human skin.



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

Structure **X** is the

(1)

- A** blood capillary
- B** dermis
- C** nerve ending
- D** sebaceous gland

(ii) Describe the role of the sweat gland in thermoregulation.

(2)

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(iii) Explain why the muscle attached to the hair follicle is important when a person starts to feel cold.

(2)

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(b) Thermoregulation is one way in which a constant internal environment is maintained.

What is the name given to the maintenance of a constant internal environment?

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

(1)

- A** homeostasis
- B** hypothalamus
- C** vasoconstriction
- D** vasodilation

(c) Explain why the temperature of the human body needs to be maintained at 37 °C.

(2)

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(d) The photograph shows a reptile lying in sunlight.



Explain why reptiles lie in sunlight for long periods of time.

(2)

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(Total for Question 4 = 10 marks)



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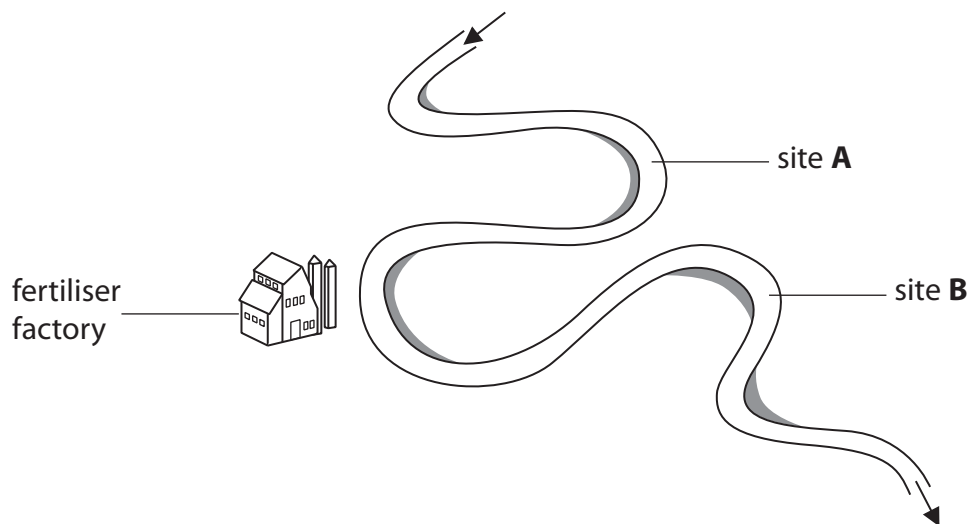
Question 5 is on the next page



Pollution

5 The diagram shows a river and the location of a fertiliser factory.

The arrows indicate the direction of the flow of the river.



A scientist recorded the nitrate concentrations of the water at site **A** and site **B**.

Her results are shown in the table.

site	nitrate concentration / mg per dm ³			
	sample 1	sample 2	sample 3	mean
A	17	25	18	20
B	49	64	58	

(a) (i) Calculate the mean nitrate concentration found at site **B**.

(2)

answer = mg per dm³



(ii) The scientist observed algae and some dead fish in the river at site **B**.

These were not present at site **A**.

Give an explanation for these observations.

(4)

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***(b)** Scientists observe living organisms in an environment to assess the level of pollution.

Describe how the level of water pollution and air pollution can be assessed using living organisms.

(6)

Dotted lines for writing the answer.

(Total for Question 5 = 12 marks)



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Question 6 is on the next page



Resistant organisms

- 6 (a) The photograph shows the common rat *Rattus norvegicus*.



State the level of classification for both parts of the binomial name *Rattus norvegicus*.

(2)

Rattus

norvegicus

- (b) Some rats have a mutation which enables them to eat the rat poison Warfarin and survive.

Suggest how the use of Warfarin could lead to an increase in the number of rats with this mutation.

(2)

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(c) The allele for Warfarin resistance is recessive.

Complete the Punnett square to show how two rats, both heterozygous for Warfarin resistance, could produce Warfarin resistant offspring.

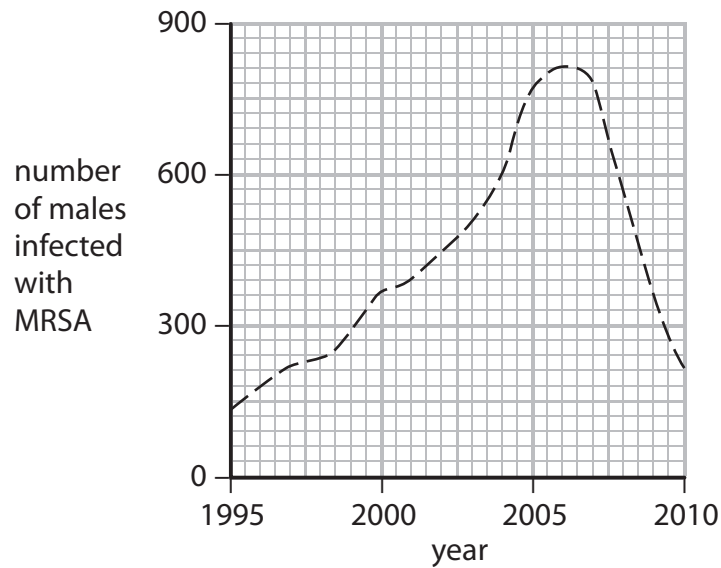
Use **R** and **r** to show the dominant and recessive alleles.

(2)



*(d) Hospitals have introduced programmes to reduce MRSA infections in patients because antibiotics have become less effective.

The graph shows the number of males infected with MRSA during their stay in hospital.



A programme of intensive use of antiseptics in hospitals has been used since 2005.

Use the information given and your own scientific knowledge to explain the trends shown in the graph.

(6)

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(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS



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