

Write your name here

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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 17 May 2016 – Afternoon

**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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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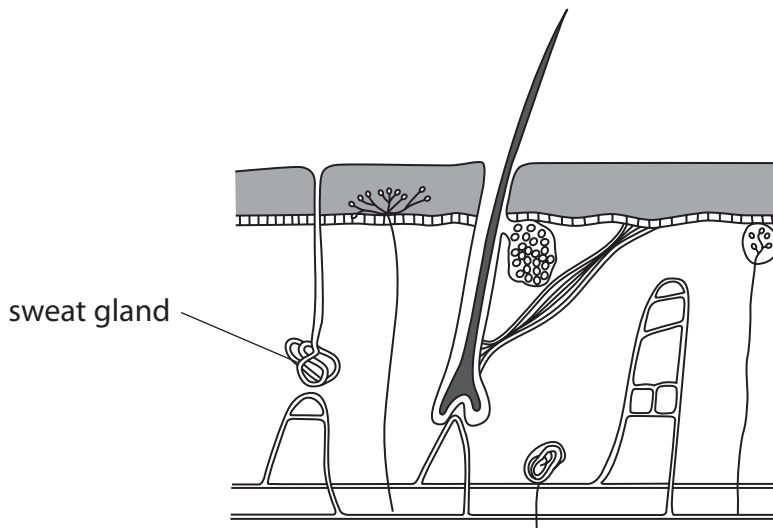
**PEARSON**

**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 ☒.**

**A changing environment**

**1** The diagram shows a section through human skin.



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

The maintenance of a stable internal environment is called

(1)

- A** speciation
- B** homeostasis
- C** hybridisation
- D** variation

(ii) Explain how sweat glands can help the human body to cool down.

(2)

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(b) Blood vessels in the skin help to regulate body temperature.

Explain how blood vessels reduce the amount of heat lost from the body.

(3)

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(c) Body temperature can vary.

Describe how the brain is involved in thermoregulation.

(2)

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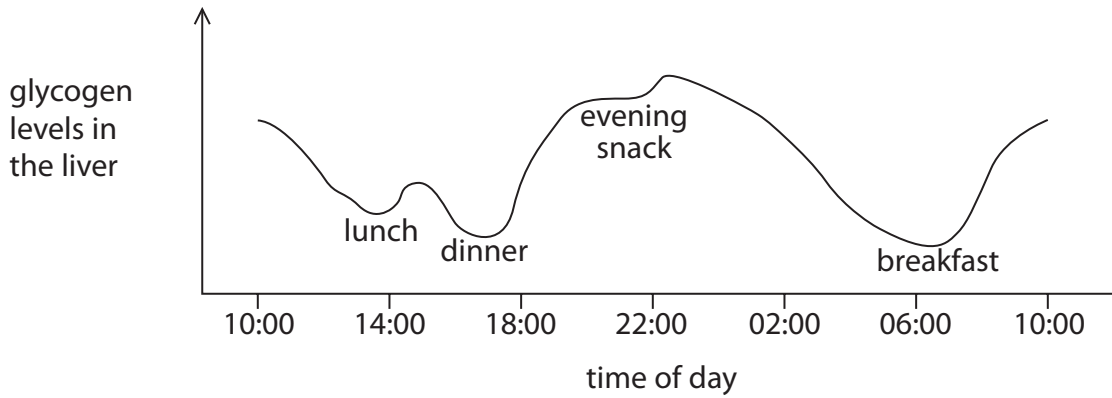
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**(Total for Question 1 = 8 marks)**



### Blood glucose regulation

2 The graph shows the glycogen levels in the liver of a healthy male during 24 hours.



(a) State the time when the glycogen in the liver is at its highest level.

(1)

(b) Explain why glycogen levels in the liver increase after a meal.

(4)

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(c) A male with untreated Type 2 diabetes ate lunch with the same carbohydrate content as the healthy male in the graph.

Explain why the glycogen level in the liver of the male with untreated Type 2 diabetes would be different from the healthy male after this meal.

(3)

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**(Total for Question 2 = 8 marks)**



### Plant hormones

3 Paul investigated the effect of sunlight on the growth of the shoots of four plants.

The shoots were treated in the following way.

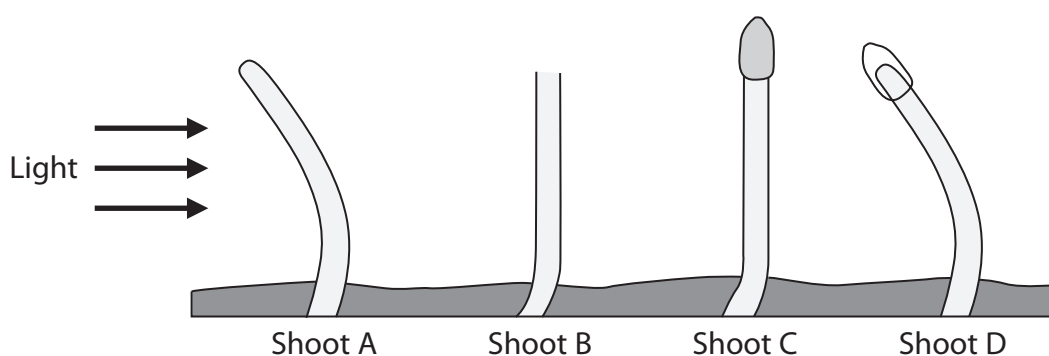
Shoot A had no changes made to it.

Shoot B had the tip of the shoot removed.

Shoot C had a black cap placed over the tip.

Shoot D had a clear cap placed over the tip.

The diagram shows the shoots after one week.



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

The growth response shown by shoot A and shoot D is an example of

(1)

- A negative geotropism
- B negative phototropism
- C positive geotropism
- D positive phototropism

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(ii) Explain how shoot A and shoot D show this growth response.

(3)

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(iii) Explain why shoot C did not respond in the same way as shoot A and shoot D.

(2)

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(b) Auxins can be used as a selective weed killer.

Explain how auxins kill weeds.

(2)

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(c) State two commercial applications of plant hormones.

(2)

1 .....

2 .....

**(Total for Question 3 = 10 marks)**

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### Sickle cell disease

4 Sickle cell disease is caused by a change in one of the bases coding for an amino acid on chromosome 11.

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

The part of the cell that contains chromosome 11 is the

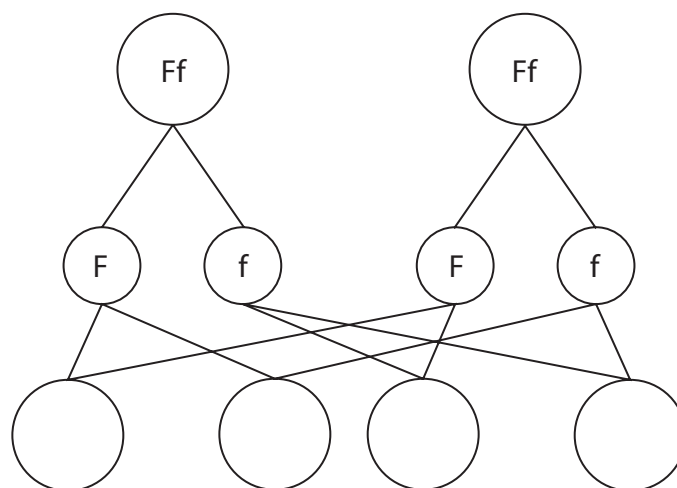
(1)

- A cytoplasm
- B cell membrane
- C nucleus
- D cell wall

(b) (i) Sickle cell disease is a recessive genetic disorder.

Complete the genetic diagram to show the possible genotypes from two heterozygous parents.

(2)



(ii) Calculate the percentage probability that the offspring will be carriers of the sickle cell allele but not have sickle cell disease.

(1)





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

People with sickle cell disease have a change in the shape of their (1)

- A ciliated cells
- B mucus-producing cells
- C red blood cells
- D white blood cells

(d) People with an allele for sickle cell disease are less likely to have malaria.

(i) Describe how malaria is transmitted. (2)

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(ii) Explain why the percentage of people with sickle cell disease is higher in countries where malaria is present than in countries where malaria is not present. (3)

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**(Total for Question 4 = 10 marks)**



### Nutrient cycles

- 5 Scientists set up three experiments to investigate the effect of watering plants with solutions containing different masses of nitrate fertiliser.

Plants were watered with 100 cm<sup>3</sup> of a solution containing either 0.1 g, 0.3 g or 0.5 g of nitrate fertiliser. This was repeated each day for four weeks.

The increase in height of each plant was recorded and the results are shown in the table.

mass of nitrate fertiliser / g	increase in plant height after 4 weeks / mm			
	plant 1	plant 2	plant 3	mean
0.1	32	27	37	32
0.3	39	40	41	40
0.5	51	67	56	58

- (a) (i) Using information from the table, describe the effect of nitrate fertiliser on the growth of these plants.

(2)

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- (ii) Calculate the difference in growth per week for the plants watered with solutions containing 0.1 g and 0.5 g of nitrate fertiliser.

(3)

..... mm per week

- (iii) Plants absorb nitrates and use them to make molecules required for growth.

State the name of this type of molecule that is required for growth.

(1)

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\*(b) Describe the roles of bacteria in the nitrogen cycle.

(6)

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(Total for Question 5 = 12 marks)



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## Classification and evolution

6 The photograph shows the Californian puffball.

This is a type of fungus.



(a) (i) Which of the following is the correct way of writing the binomial name of the Californian puffball?

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

(1)

- A LYCOPERDON PERLATUM
- B lycoperdon perlatum
- C *Lycoperdon perlatum*
- D *lycoperdon Perlatum*

(ii) Which row of the table shows the correct description for a binomial name?

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

(1)

	first part of binomial name	second part of binomial name
<input type="checkbox"/> A	genus	species
<input type="checkbox"/> B	species	genus
<input type="checkbox"/> C	kingdom	species
<input type="checkbox"/> D	kingdom	genus



(iii) Describe the main characteristics of the cells of organisms in the kingdom Fungi.

(2)

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(iv) Describe how organisms in the kingdom Fungi feed.

(2)

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\*(b) Explain Darwin's theory of evolution by natural selection.

(6)

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**(Total for Question 6 = 12 marks)**

**TOTAL FOR PAPER = 60 MARKS**



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