OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B5.6 WHAT CAN HAPPEN WHEN ORGANS AND CONTROL SYSTEMS STOP WORKING? (HIGHER)

SCORE	PERCENTAGE
/35	%

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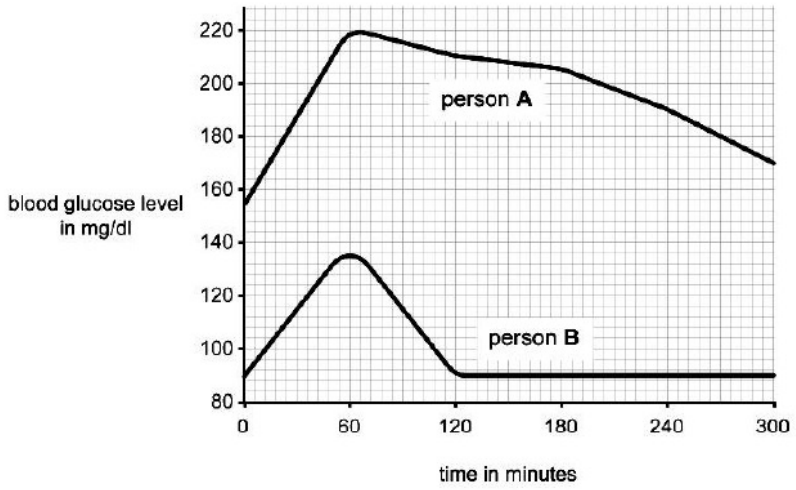
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1.

(i) Insulin is a hormone produced by the pancreas.

The graph below shows data from two people who were given a sugary drink.

Their blood sugar level was recorded every 60 minutes from when they had the drink.



There are two types of diabetes – type 1 and type 2.

Person A has type 2 diabetes.
Person B does not have diabetes.

Describe how the graph shows this and explain why there is a difference in the blood sugar level.

---

[2]

(ii) The statements below apply to type 1 and type 2 diabetes.

Draw two lines to link the sentences to **type 1 diabetes**.

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Type 1 diabetes	body no longer responds to the insulin produced
	should eat a diet high in complex carbohydrates and exercise
	will need to inject insulin
	pancreas stops producing insulin

[2]

2.

(i) Mia has an eye disease that weakens the fibres that hold her cornea in place.

Her cornea has become damaged causing its shape to change.

What is the role of the cornea and how will damage to the shape affect Mia's sight?

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[2]

(ii) Scientists are now using stem cells to repair damage to corneas.

What is a stem cell?

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[1]

(iii) Stem cells can be obtained from embryos.

Why are some people against using embryos as a source of stem cells?

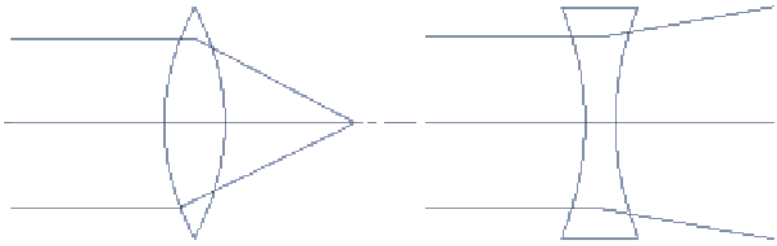
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[1]

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3(a). Nikita draws ray diagrams for two lenses, **A** and **B**.



Lens A **Lens B**

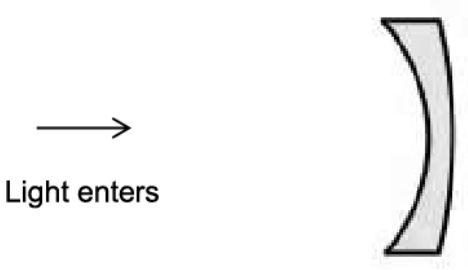
(i) Suggest which lens, **A** or **B**, would improve Nikita's vision.

Explain your answer.

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[2]

(ii) Nikita investigates other lenses. One is shown below.



Use the ray diagrams from part (b) to suggest the type of visual impairment that a pair of glasses with this lens would correct.

Explain your answer.

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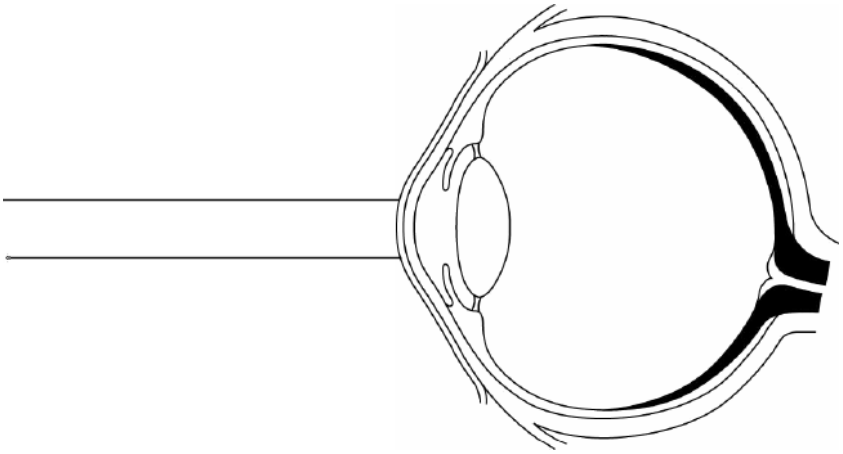
[4]

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(b). Nikita visits her optician who tells her she is **long sighted**.

Complete the ray diagram to show what happens to the rays of light when they enter Nikita's eye.



[2]

(c). Failure of vision can sometimes be caused by brain damage and disease.

Describe and explain the limitations of treating damage to the brain.

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[4]

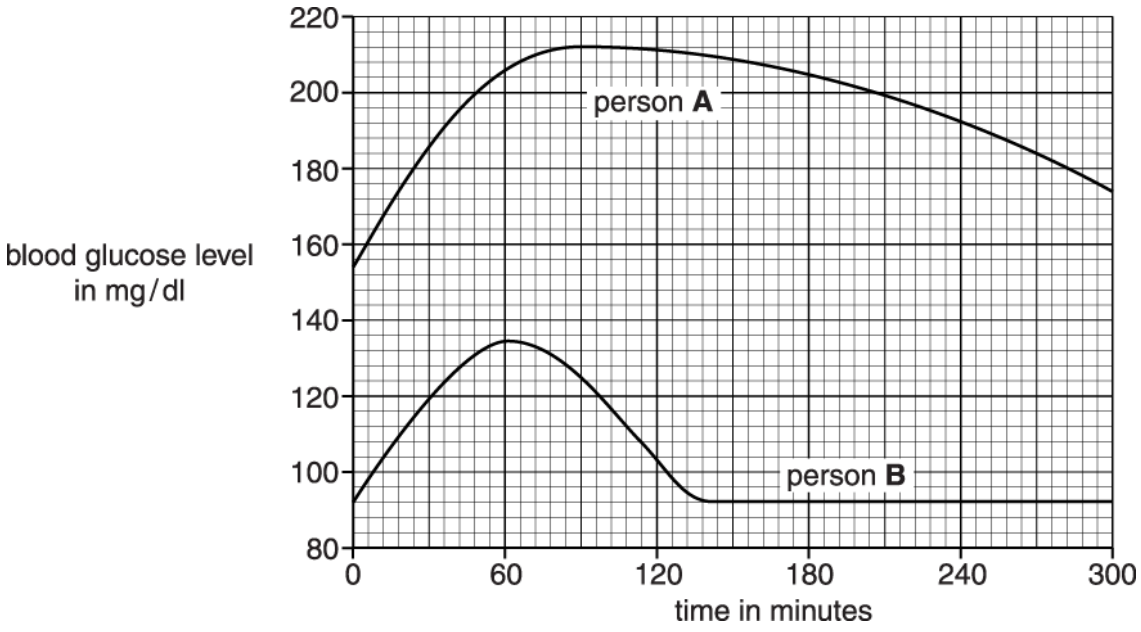
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4(a). The Oral Glucose Tolerance Test (OGTT) is done to measure how quickly glucose is removed from our blood after we swallow a glucose drink. The levels of blood glucose are measured using blood samples taken over a period of time.

The stages in this test are:

1. Do not eat or drink for eight hours.
2. Give a blood sample.
3. Drink a glucose drink.
4. Give blood samples over the next few hours.

The graph shows the results of this test on two different people.



After how many minutes did person **A** and person **B** reach a maximum blood glucose level?

person **A** _____ minutes

person **B** _____ minutes

[1]

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(b). Use the graph to describe **three** other ways that the blood glucose level of person **A** differs from the blood glucose level of person **B**.

---

[3]

(c). What conclusions can you make about the health of person **A** and person **B**?

Explain your answer.

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[3]

(d). A doctor observed an OGTT graph of another patient and predicted that the patient was healthy. Further tests showed this patient was indeed healthy.

Explain what it means to a scientist when an observation agrees with a prediction.

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[2]

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5(a). Jenny has type 2 diabetes.

Which of the following dietary factors can help Jenny to control her diabetes?
Put ticks (?) in the boxes next to the correct answers.

take vitamin supplements	☐
have a high fibre diet	☐
eat more protein	☐
increase energy (food) intake	☐
eat more complex carbohydrates	☐
take mineral supplements	☐

[2]

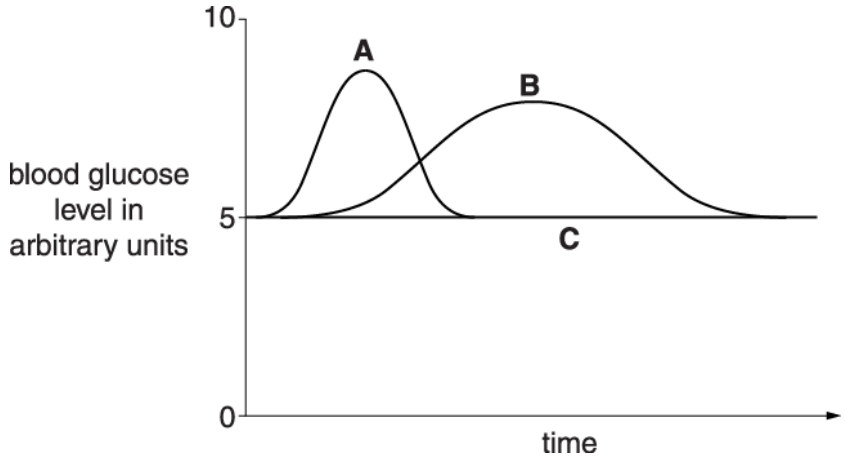
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(b). Controlling glucose level in the blood is important.

After eating a meal, the blood glucose level may rise and then fall back to normal.

The graph shows changes in blood glucose level after eating meals containing three different foods, **A**, **B** and **C**.



Write the correct letter, **A**, **B** or **C** next to the most likely food in each meal.

type of food	letter
fibre	
glucose drink	
complex carbohydrate (starch)	

[2]

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(c). Protein in food has to be processed by the digestive system in the same way as complex carbohydrates, before entering the blood stream.

Some people with type 1 diabetes do not produce enough of the hormone insulin.

These people inject themselves with insulin.
Insulin is a protein.
Why is insulin usually injected rather than taken as a tablet?
Put ticks (?) in the boxes next to the **two** correct answers.

Insulin in tablets enters the blood stream too quickly.	☐
Tablets are more likely to cause infection.	☐
Insulin in tablets is more likely to cause an overdose.	☐
Insulin in injections will work faster.	☐
Insulin needs to be injected straight into the pancreas.	☐
Insulin in tablets is likely to be digested and broken down.	☐

[2]

END OF QUESTION PAPER

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