OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B5.4 WHY DO WE NEED TO MAINTAIN A CONSTANT INTERNAL ENVIRONMENT? (HIGHER)

SCORE	PERCENTAGE
/30	%

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1(a). Zak's results suggest that being wrapped in wet clothes would be the least effective way of staying warm on a mountain.

Explain what happens in this situation.

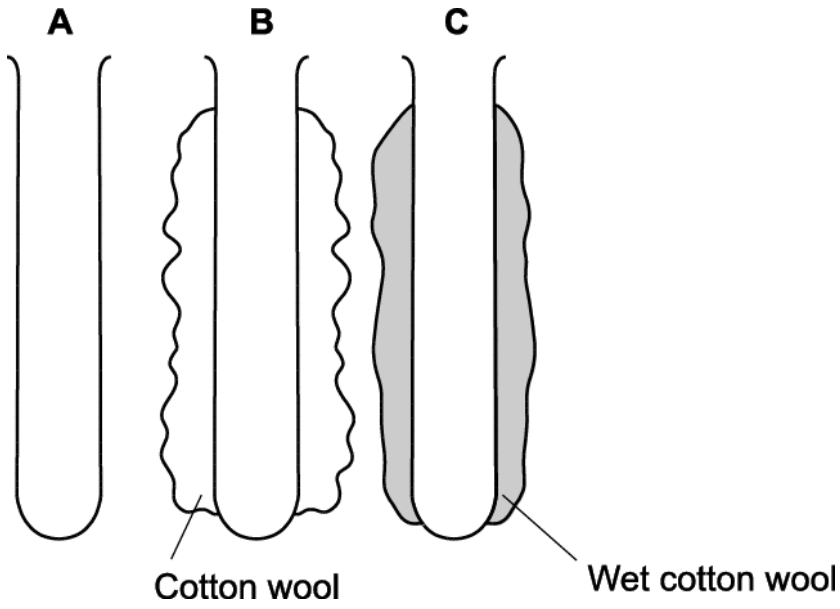
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[2]

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(b). Zak is investigating the most effective method for staying warm on a mountain. He sets up test tubes as below.



Test tube A has no insulation. Test tube B is wrapped in cotton wool. Test tube C is wrapped in wet cotton wool.

Describe an investigation that Zak could carry out to find out more about the most effective conditions for staying warm on a mountain.

He also has access to thermometers, hot water and stopwatches.

Include information about what data will be collected, how it will be recorded and how it will be made valid.

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[4]

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(c).

(i) If a person was wrapped in wet clothes on a mountain, their skin would appear pale.

Explain why.

---[2]

(ii) If a person has an infection, caused by bacteria or a virus, they may have a fever. This means the internal temperature control mechanisms are no longer working correctly.

Suggest why this might be an advantage to a person suffering from a bacterial or viral infection.

---[1]

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2(a). Marty drinks a large glass of water.



The water is absorbed into his blood.

The hormone ADH helps to control the water balance in Marty's body.

Which part of the body secretes ADH?

Draw a (ring) around the correct answer.

blood

heart

kidney

pituitary gland

[1]

(b). Explain how the regulation of water in Marty's blood plasma is achieved using ADH.

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[4]

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3. In 1774 a scientist called Sir Charles Blagden designed an experiment to test the effect of high temperatures on the human body.

The temperature of the human body is 37 °C.

Blood boils just above 100 °C.

He entered a room where the air temperature was above 127 °C.

He placed an egg and a piece of meat in the room.

The egg was cooked in 15 minutes and the meat in 35 minutes.

A student predicted that Sir Charles Blagden's body temperature would rise and he would die very quickly.

Do you think the student's prediction is correct?

Justify your answer.

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[3]

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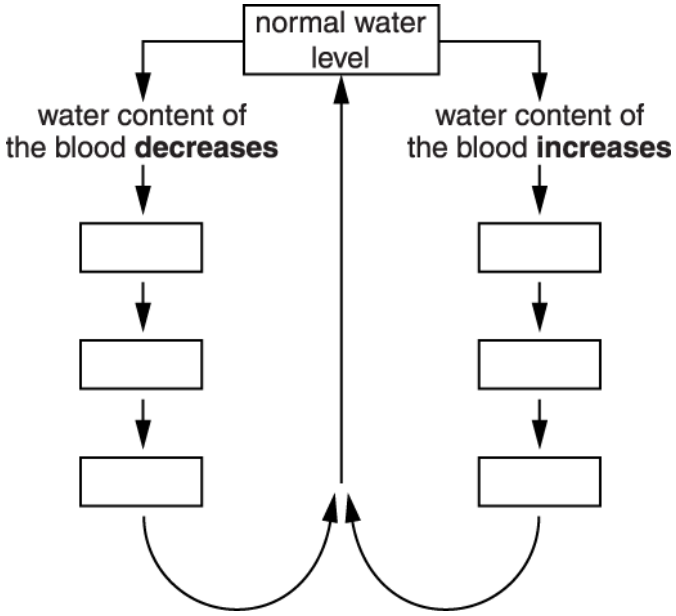
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4. This question is about regulating water content in animals.

Negative feedback is used to control the water content of the human body.
These statements show stages in this process.

A The kidney produces more urine.
B More ADH is released from the pituitary gland.
C The kidney reabsorbs less water from the urine.
D The kidney reabsorbs more water from the urine.
E Less ADH is released from the pituitary gland.
F The kidney produces less urine.

Write the letters, **A**, **B**, **C**, **D**, **E** and **F**, in the correct boxes.



[3]

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5. The human body responds to changes so that it can maintain a constant internal environment.

* When temperature receptors in the skin and hypothalamus detect a drop in temperature, the hormone adrenaline is released from the adrenal gland.

Explain how the release of adrenaline could help the body to raise its core temperature back to normal.

[6]

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6. This question is about regulating water content in animals.

The gerbil is an animal adapted to living in deserts.

It feeds on plants.

The gerbil can go for very long periods of time without drinking water.

Suggest how the gerbil manages to survive on so little water.

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[4]

END OF QUESTION PAPER

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