



22126014

**BIOLOGY
HIGHER LEVEL
PAPER 2**

Thursday 17 May 2012 (afternoon)

2 hours 15 minutes

Candidate session number

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Examination code

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INSTRUCTIONS TO CANDIDATES

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all questions.
- Section B: answer two questions.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is [72 marks].



0116

SECTION A

Answer *all* questions. Write your answers in the boxes provided.

1.

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(Question 1 continued)

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(Question 1 continued)

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2. Two foods were measured with a calorimeter to determine the energy in each. Five trials on potato chips and five trials on walnuts were performed. The results are shown in the table below.

Trial	Potato chip / kJ g^{-1}	Walnut / kJ g^{-1}
1	22.4	24.1
2	21.7	23.8
3	21.9	25.2
4	22.0	28.0
5	22.0	27.9
Mean	22.0	missing value
Standard deviation	0.1	2.0

- (a) Calculate the mean energy for the walnut. [1]

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- (b) Explain how this data shows which food had the greatest variation in its energy content. [2]

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- (c) Both potato chips and walnuts contain lipids. State **one** function of lipids. [1]

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3. (a) Blood transports molecules throughout the body. State where the blood absorbs

(i) hormones. [1]

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(ii) carbon dioxide. [1]

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(b) Describe **three** features of alveoli that adapt them to gas exchange. [3]

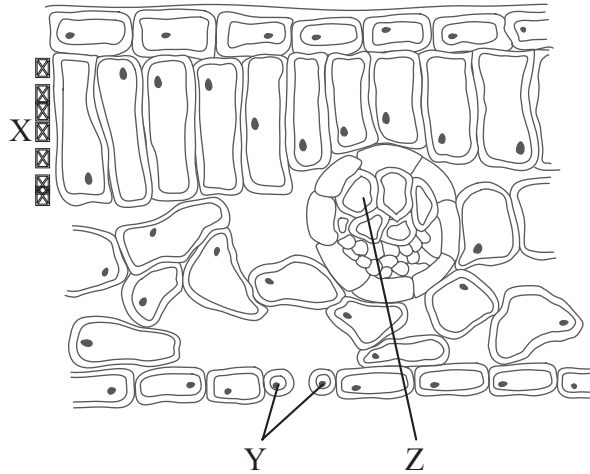
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(c) Explain how the structure of capillaries relates to their functions. [3]

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4. The diagram shows a cross section of a leaf.



(a) Identify the tissues labelled X, Y and Z.

(i) X: [1]

(ii) Y: [1]

(iii) Z: [1]

(b) Outline **two** adaptations of xerophytes that help to reduce transpiration from the leaves. [2]

- 1.
- 2.

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(Question 4 continued)

- (c) Angiospermophyta have vascular tissue (xylem and phloem) that bryophyta lack. Suggest advantages that vascular tissue confers. [3]

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SECTION B

Answer **two** questions. Up to two additional marks are available for the construction of your answers. Write your answers in the boxes provided.

5. (a) List the general functions of non-membrane proteins. [4]
- (b) Outline the digestion, absorption and assimilation of proteins in humans. [6]
- (c) Actin and myosin are two proteins found in muscles. Explain how skeletal muscle contracts, including the interaction of these proteins. [8]
6. (a) Describe the relationship between genes, polypeptides and enzymes. [4]
- (b) Outline control of metabolic pathways. [6]
- (c) Discuss the use of lactase in the production of lactose-free milk. [8]
7. (a) Outline pollination, fertilization and seed dispersal. [4]
- (b) Compare the processes of spermatogenesis and oogenesis. [8]
- (c) Describe the consequences of overpopulation of a species. [6]
8. (a) Outline how **three** properties of water enhance its use by living organisms. [6]
- (b) Describe the role of ADH in osmoregulation. [4]
- (c) Explain how water is moved from roots to leaves in terrestrial plants. [8]



