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NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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SUPERVISOR'S USE ONLY

Level 1 Biology, 2011

90928 Demonstrate understanding of biological ideas relating to the life cycle of flowering plants

9.30 am Friday 18 November 2011
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of biological ideas relating to the life cycle of flowering plants.	Demonstrate in-depth understanding of biological ideas relating to the life cycle of flowering plants.	Demonstrate comprehensive understanding of biological ideas relating to the life cycle of flowering plants.

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

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You are advised to spend 60 minutes answering the questions in this booklet.

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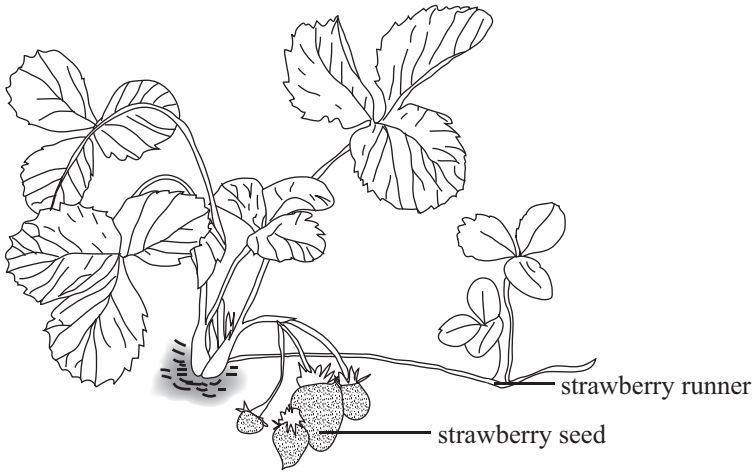
QUESTION ONE: REPRODUCTION

Some plants, such as the strawberry, are able to reproduce both sexually and asexually. The diagram below shows a strawberry plant.



(a) Describe an advantage to a plant of **sexual** reproduction.

(b) Explain how **asexual** reproduction can affect the **dispersal** of plant offspring.

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(c) In sexual reproduction in flowering plants, flowers can be pollinated by either wind or insects. The diagrams below show a wind-pollinated flower and an insect-pollinated flower.

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Robson and Morgan, *Biology Today* (Macmillan Education, 1980), p 119.

Compare and contrast the features of the flower that allow pollination to occur in wind-pollinated flowers and insect-pollinated flowers.

In your answer you should:

- describe features of the wind-pollinated flower and insect-pollinated flower that allow the pollen to be successfully transferred
- describe features of the pollen of each flower type that allow successful transfer of pollen
- explain how the features of each flower type and the **pollen** of each flower type enable pollen to be transferred successfully.

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QUESTION TWO: PHOTOSYNTHESIS

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Plants require raw materials to carry out photosynthesis. These raw materials include water, carbon dioxide, chlorophyll and light.

Two parts of a green plant are involved in collecting these raw materials for photosynthesis and carrying out photosynthesis – the roots and leaves, as shown in the diagram below.

Adapted from www.phschool.com/science/biology_place/biocoach/images/plants/plant.gif

Discuss how the parts of the plant work together using raw materials, to carry out photosynthesis.

In your answer you should:

- describe the process of photosynthesis
- explain how the parts of the plant are involved in photosynthesis
- explain how adaptations of the plant allow it to carry out photosynthesis more efficiently
- relate how the parts of the plant work together using raw materials, to carry out photosynthesis.

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QUESTION THREE: GERMINATION

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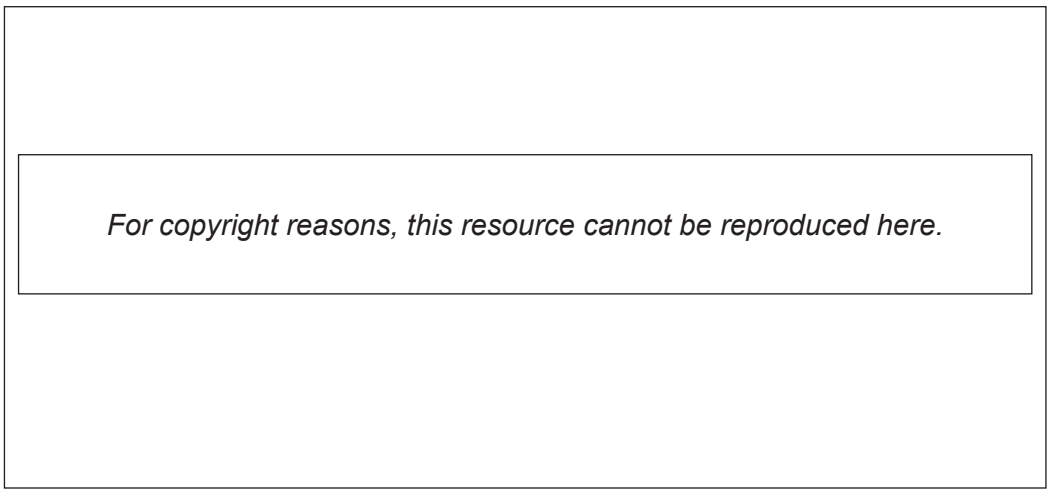
The diagram below shows a typical dicotyledon seed.



Mackean, *Life Study: A Textbook of Biology* (John Murray Publishers, 1981), p 82.

A seed can germinate only in suitable environmental conditions.

(a) Describe TWO of the main environmental conditions necessary before a seed can germinate. Explain the role that each condition plays in triggering germination.

(b) Explain how ONE of the structures labelled in the diagram allows the seed to survive for long periods of time, before it finally germinates.

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Question Three continues on the following page.

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(c) The graph below shows the changes in dry mass and live mass of a bean seed during germination.

Live mass is the mass of living tissue, including water, in the seed and the seedling.

Dry mass is the mass of the seed and seedling, without water.

Biology and Human Biology NCEA Level 1 (ESA Publications, 2008), p 233.

Discuss the changes in both dry mass and live mass AND relate these changes to the process of germination.

In your answer you should:

- describe the process of germination
- describe the changes to both the dry mass and live mass
- explain why the dry mass and live mass show these changes
- relate BOTH the change in dry mass and the change in live mass to the process of germination.

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Extra space if required.
Write the question number(s) if applicable.

QUESTION NUMBER

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