Life Cycles of Plants

For questions 1 – 2, write down your answers in the spaces provided.

1. An experiment was conducted during the growth of a seed into a young plant. The seedling was placed in a room with all the suitable conditions needed for germination. The mass of the seed leaves and shoot were recorded as shown in the table below.

	Day 1	Day 3	Day 5	Day 7	Day 9
P	1 g	0.8	0.6	0.4	0.2
Q	0 g	0.2 g	0.4 g	0.6 g	0.8 g

(a) What conditions must be present for germination of a seed to take place? [1m]

_____

(b) **(i)** Is P or Q more likely to be the shoot of the plant? [1m]

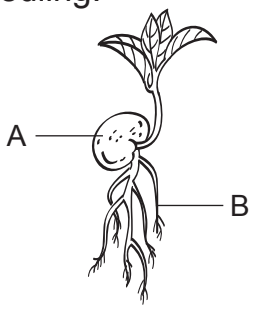
_____

(ii) Explain clearly your answer in (i). [2m]

_____

_____

2. This diagram below shows a seedling.



(a) Identify the parts, A and B, of the seedling. [1m]

A: _____

B: _____

(b) A seed has a huge food reserve. Why is it necessary for a seed to have this huge food reserve? [1m]

_____

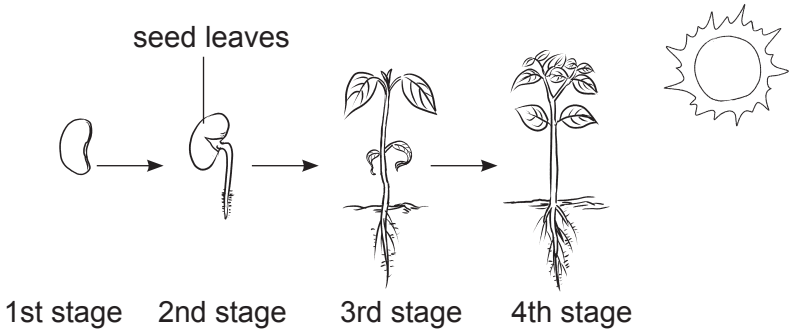
_____

(c) (i) With reference to the diagram, explain clearly what will happen if A is removed from the seedling. [2m]

(ii) With reference to the diagram, explain clearly what will happen if B is removed from the seedling. [2m]

For questions 3 – 5, write down your answers in the spaces provided.

3. Study the diagram below.



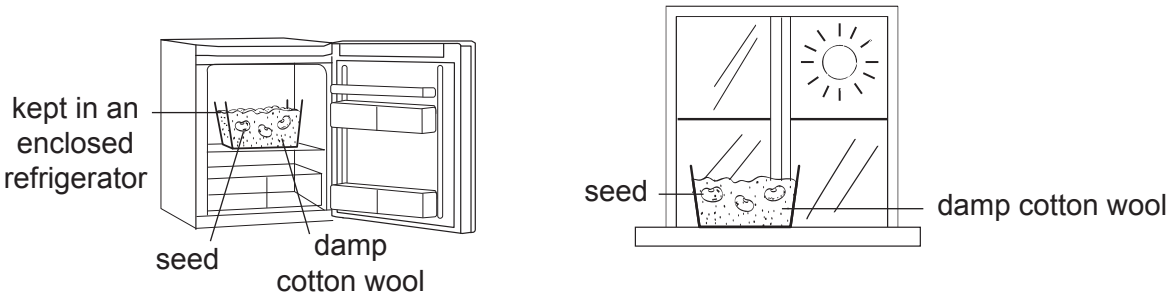
(a) (i) What can be observed if Brandon cuts away the seed leaves at the second stage? [1m]

(ii) Explain your answer given in (i). [2m]

(b) (i) What do you think will happen if Brandon decides to cut away the leaves that have just formed on the seedling at the third stage? [1m]

(ii) Given your answer in (i), why do you think that happens? [1m]

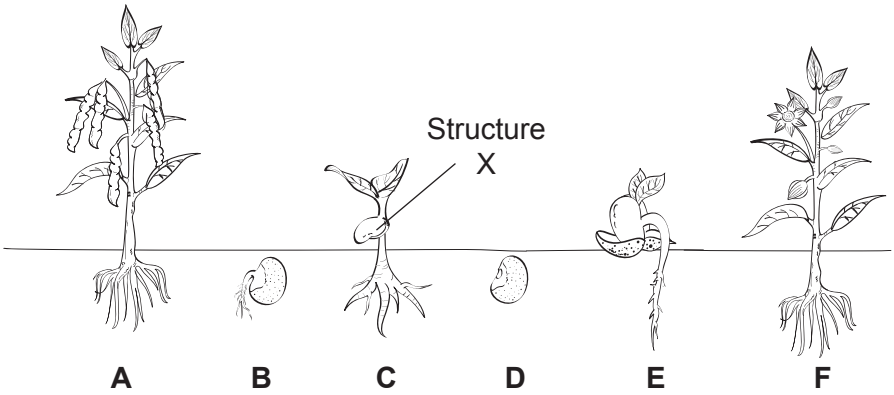
4. Louis set up an experiment as shown below.



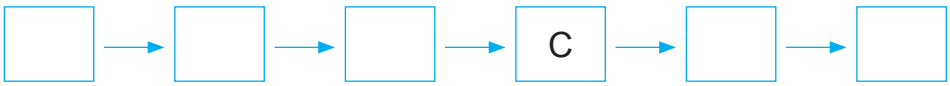
(a) What observations can be made for both set-ups after 5 days? [1m]

(b) What hypothesis is being tested in the above experiment? [1m]

5. The diagrams below show the different stages of a bean plant. They are not in the correct order.



(a) Arrange the letters in the boxes to complete the life cycle of a plant. 'C' has been written in one of the boxes. [1m]

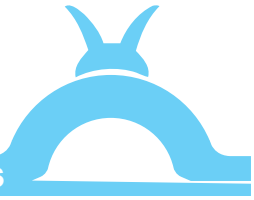


(b) **(i)** What is the structure labelled X? [1m]

(ii) What is its function? [1m]

ANSWER TO

Life Cycles of Plants



1. (a) They are air, warmth and water.
   (b) (i) Q is more likely to be the shoot of the plant.
   (ii) As the seed grows into a young plant, its shoot will increase in mass. Therefore, Q is the shoot. P is most likely the seed leaves of the plant as they shrivel up and fall off when the plant starts to make its own food.

2. (a) A: seed leaf
   B: roots
   (b) The food reserve in the seed provides nourishment to the growing embryo.
   (c) (i) As the seedling has grown its own leaves, it is able to make its own food. Therefore, the seedling will be able to grow into an adult plant even if A which is the seed leaf is removed.
   (ii) The roots take in water for the seedling. Without them, the seedling will not be able to receive water and will die.

3. (a) (i) The seedling will die after a few days.
   (ii) Seed leaves provide food to the seedling when its own leaves have yet to develop.
   (b) (i) The seedling will die after a few days.
   (ii) At this stage, the seed leaves are already shrivelled up and are ready to fall off. Without seed leaves or leaves to produce food during photosynthesis, the seedling will have no other source of food to survive.

4. (a) The seed in Set-up A did not grow while the seed in Set-up B grew into a seedling.
   (b) Seeds need warmth, apart from air and water to germinate.

5. (a) D → B → E → C → F → A
   (b) (i) It is the seed leaves.
   (ii) It provides food for the seed as it grows.