Past-paper walk-through

Tropic responses ▪ 14.5

eXercise

Questions in this set

- 0610/22 N25 Q21 ▪ 1 mark
- 0610/23 N25 Q25 ▪ 1 mark
- 0610/21 J25 Q25 ▪ 1 mark
- 0610/22 J25 Q26 ▪ 1 mark
- 0610/23 J25 Q26 ▪ 1 mark
- 0610/41 J25 Q6 ▪ 10 marks
- 0610/22 M25 Q23 ▪ 1 mark

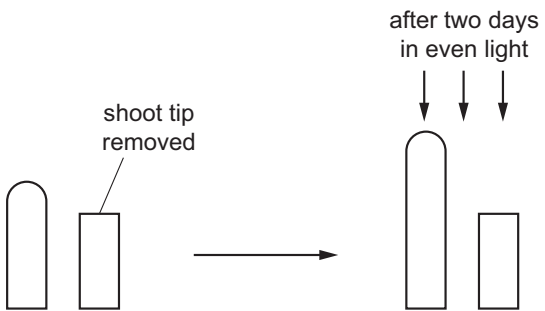
Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- // separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = "or words to that effect" – the wording need not match.

Question 21

0610/22 N25 ▪ Q21 ▪ 1 mark

21 The diagram shows an experiment using two wheat shoot tips, X and Y.



Question 21

X Y X Y

Which statement is supported by the evidence provided by this experiment?

A Auxin moves through the plant by osmosis.

B Auxin is made in the shoot tip.

C Auxin is unequally distributed in response to light.

D Auxin inhibits cell elongation.

Solution 21

Answer: **B**

Why

- Auxin is produced in the shoot *tip*.
- Removing the tip removes the auxin source, so that shoot stops elongating.
- The shoot that keeps its tip continues to grow, which shows the tip is where the growth substance comes from.

Question 25

0610/23 N25 ▪ Q25 ▪ 1 mark

25 A student writes four statements about auxin.

1 Auxin becomes more concentrated on the lower side of a horizontal stem.

2 Auxin becomes more concentrated on the side of the shoot that has more light.

3 Auxin is made in the shoot tip.

4 Auxin prevents cell elongation in the shoot.

Which statements describe what happens during chemical control of plant growth?

A 1, 2 and 4 **B** 1 and 2 only **C** 1 and 3 **D** 2, 3 and 4

Solution 25

Answer: **C**

Why

- In a horizontal stem, auxin collects on the lower side under gravity.
- In a shoot, auxin collects on the *shaded* side, away from the light.
- In a shoot more auxin means more elongation, so the shaded side grows faster and the shoot bends towards the light.

Question 25

0610/21 J25 ▪ Q25 ▪ 1 mark

25 What is an example of phototropism?

A the growth of a root in the direction of gravity

B the growth of a shoot towards light

C the release of energy from glucose using light

D the synthesis of glucose using light

Solution 25

Answer: **B**

Why

- A tropism is a growth response towards or away from a stimulus.
- Phototropism is the response to light.
- A shoot growing towards light is the standard example; gravity gives gravitropism instead.

Question 26

0610/22 J25 ▪ Q26 ▪ 1 mark

26 A young seedling is growing underground.

The shoot grows towards the surface of the ground.

The root grows away from the surface of the ground.

Which row describes the responses involved?

	gravitropism		phototropism	

Question 26

	root	snoot	root	snoot
A	yes	yes	no	no
B	yes	no	no	yes
C	no	yes	yes	no
D	no	no	yes	yes

Solution 26

Answer: **A**

Why

- The shoot grows upwards, away from gravity – negative gravitropism.
- The root grows downwards, towards gravity – positive gravitropism.
- The seedling is underground, so there is no light and phototropism cannot be involved.

Question 26

0610/23 J25 ▪ Q26 ▪ 1 mark

26 A shoot tip was placed on an agar block. Substances can diffuse through agar.

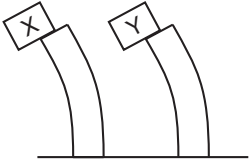
Light was shone on the shoot tip from one direction.

After three days, the agar was cut in half to form blocks X and Y. Blocks X and Y were placed on the stems of shoots that had the tips cut off. The agar blocks were kept on the shoot stems for one week.

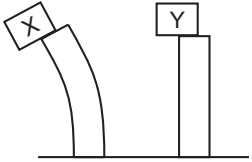
Which set of shoots represents the results after one week?

A **B**

Question 26

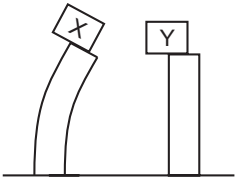


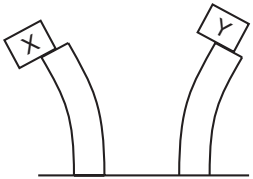
C



D

Question 26





Solution 26

Answer: **C**

Why

- Auxin is made in the shoot tip and diffuses downwards.
- Light makes it move to the shaded side, so more auxin collects there.
- So the agar on the shaded side ends up with more auxin, and that side would grow faster.

Question 6

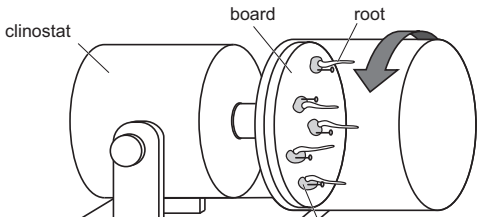
0610/41 J25 ▪ Q6 ▪ 10 marks

6 **(a)** Some maize seeds were pinned on a board and provided with light from all directions.

The board was placed in a clinostat that rotated the board.

The board was rotated continuously as the seeds germinated and the roots grew.

Fig. 6.1 shows the apparatus and results after 5 days.



Question 6

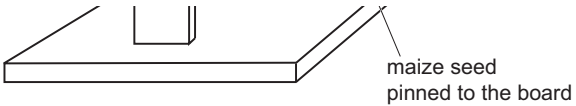


Fig. 6.1

(i) Complete the sentences to explain the root growth in Fig. 6.1.

Question 6

is equal.

Question 6

Question 6

[5]

(ii) The rotation of the clinostat was stopped.

Predict the change in growth that will occur in the germinating maize seeds in Fig. 6.1.

Question 6

(iii) State the name of the tropic response to light.

Question 6

(b) A student observed cells from a plant that had wilted.

State **and** explain the expected appearance of the cells.

Question 6

[Total: 10]

Solution 6

(a)(i)

Mark scheme

- tips ;
- diffusion ;
- gravity ;
- equal / AW ;
- elongation ;
- 5

Solution 6

(a)(ii)

Mark scheme

- (root grows) downwards / towards gravity ;
- 1

(a)(iii)

Mark scheme

- phototropism ;
- 1

Solution 6

(b) Mark scheme

- any three from:
- flaccid / no longer turgid ;
- ref. to plasmolysis ;
- lack of turgor pressure ;
- decreased volume of, cytoplasm / vacuole ;
- ref. to, decreased / low, water potential inside (plant) cells ;
- because of a, lack / loss, of water ;
- 3

Question 23

0610/22 M25 ▪ Q23 ▪ 1 mark

23 In the dark, plant shoots grow upwards and roots grow downwards.

What causes these responses?

	gravitropism	phototropism
A	no	no
B	no	yes
C	yes	no
D	yes	yes

Question 23

Solution 23

Answer: **C**

Why

- A response to gravity is gravitropism, and it works in the dark.
- Shoots grow away from gravity and roots grow towards it.
- Phototropism needs light, so it cannot be involved in the dark.