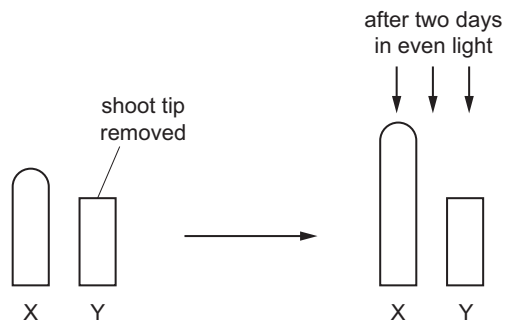


21 The diagram shows an experiment using two wheat shoot tips, X and Y.



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.

IGCSE Biology: w25 23

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

IGCSE Biology: s25 21

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

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	
	root	shoot	root	shoot
A	yes	yes	no	no
B	yes	no	no	yes
C	no	yes	yes	no
D	no	no	yes	yes

IGCSE Biology: s25 23

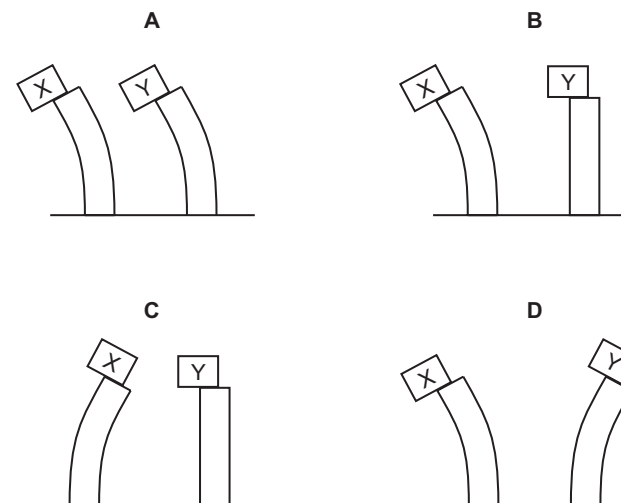
26 A shoot tip was placed on an agar block. Substances can diffuse through agar.

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?



- 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.

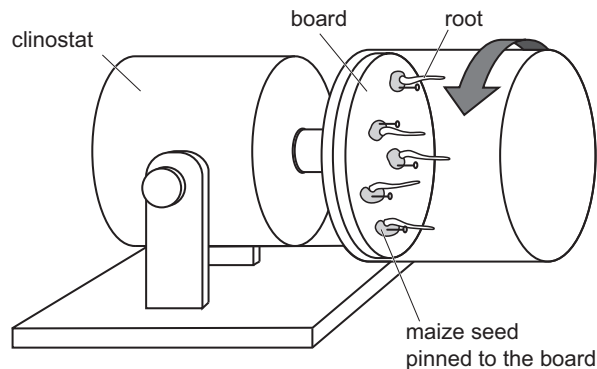


Fig. 6.1

- (i) Complete the sentences to explain the root growth in Fig. 6.1.
- Auxin is produced in shoot and root The auxin travels down the root by the process of
- As the clinostat rotates, the effect of on all sides of the root is equal.
- This causes the distribution of auxin in the root to be
- Auxin stimulates cell causing the roots to grow horizontally. [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.
- [1]
- (iii) State the name of the tropic response to light.
- [1]

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

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

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 10]

- 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