

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE (PHYSICS, BIOLOGY)

5125/01

Paper 1 Multiple Choice

October/November 2006

1 hour

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

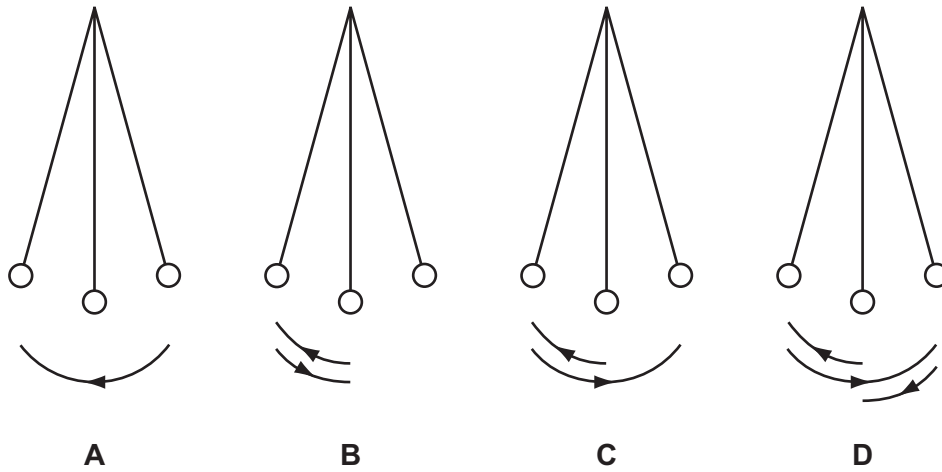
Any rough working should be done in this booklet.

This document consists of **16** printed pages.

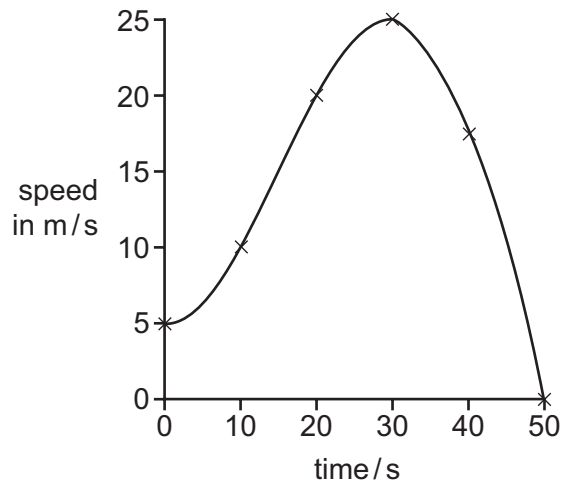


- 1 The diagrams show a simple pendulum at the ends and centre of its swing.

Which labelled arrow shows the distance moved by the pendulum during one period?



- 2 The speed-time graph is for a car as it accelerates over a period of 50 s.



What is the acceleration of the car when the time is 30 s?

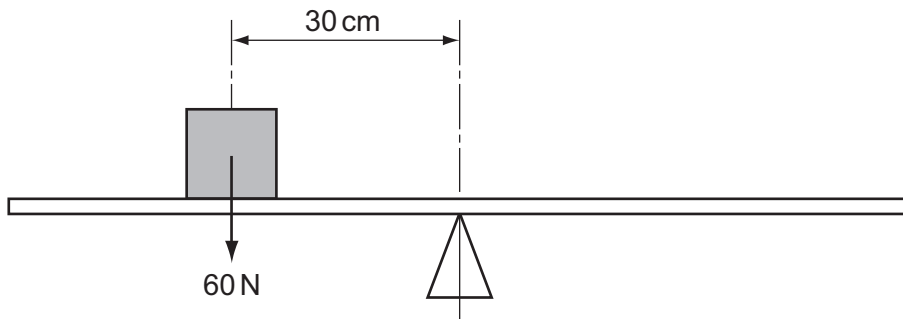
- A 0 m/s^2 B $\frac{25-5}{30} \text{ m/s}^2$ C $\frac{25}{30} \text{ m/s}^2$ D 25 m/s^2
- 3 A car driver takes a total of two hours to make a journey of 75 km. During the journey she takes a break of half an hour and spends a quarter of an hour stationary in a traffic jam.
- At what average speed must she travel during the rest of the time to complete the journey in two hours?
- A 38 km/h B 50 km/h C 60 km/h D 75 km/h

- 4 The mass and density of four objects are given in the table.

Which object has the largest volume?

	density kg/m^3	mass / kg
A	200	0.6
B	400	1.0
C	1000	2.0
D	1500	3.0

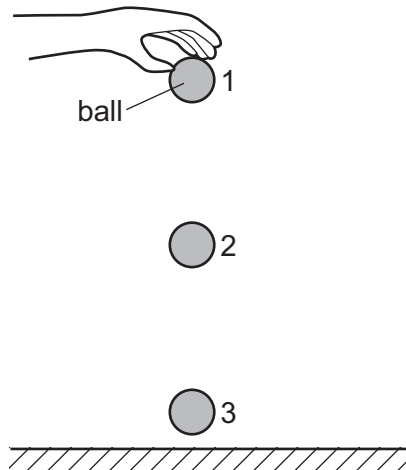
- 5 A uniform beam is balanced at its midpoint. An object is placed on the beam as shown in the diagram.



Which force will rebalance the system?

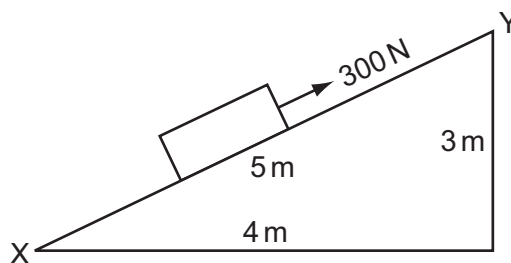
- A** 30 N acting upwards, 60 cm to the right of the midpoint
- B** 30 N acting upwards, 60 cm to the left of the midpoint
- C** 45 N acting downwards, 45 cm to the right of the midpoint
- D** 90 N acting downwards, 20 cm to the left of the midpoint

- 6 A ball is dropped from a height as shown.



Ignoring the effects of air resistance, the **total** energy is

- A** greatest at point 1.
B greatest at point 2.
C greatest at point 3.
D the same at all points.
- 7 A 300 N force is applied to a box in the direction XY in order to move it up a ramp of the dimensions shown.

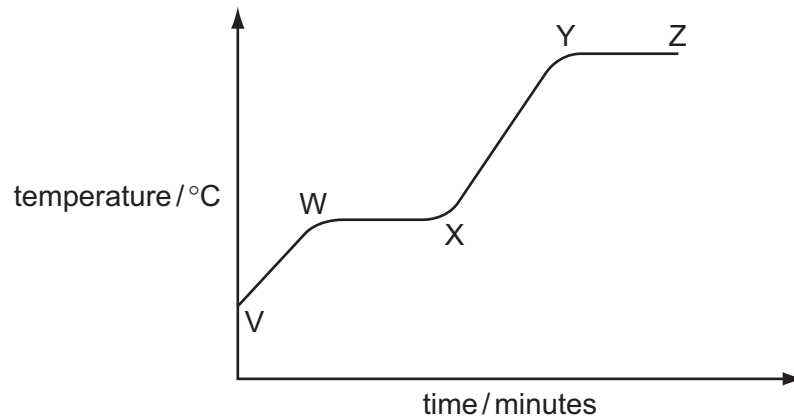


How much work is done when moving the box from X to Y?

- A** 900 J **B** 1200 J **C** 1500 J **D** 3000 J

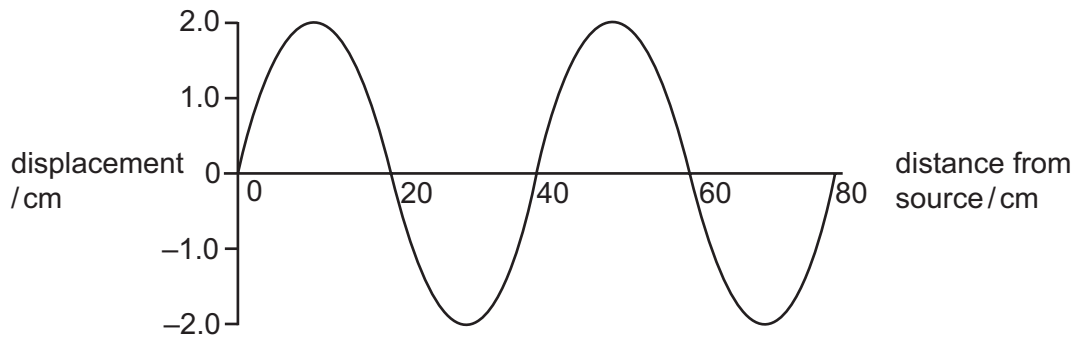
- 8 Some ice is placed in a beaker and is heated.

The graph shows the temperature of the beaker and its contents during the experiment.



Between which two points on the graph does the beaker contain a mixture of liquid and gas?

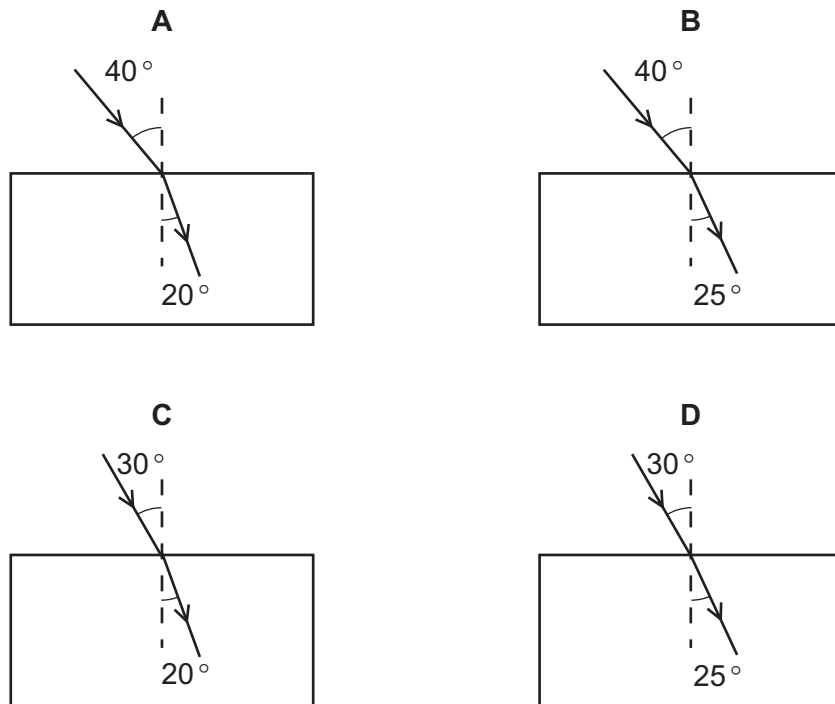
- A** Y and Z **B** X and Y **C** W and X **D** V and W
- 9 The diagram shows the variation of the displacement of a wave with distance from the source.



What is the amplitude of the wave?

- A** 2.0 cm **B** 4.0 cm **C** 20 cm **D** 40 cm

10 Which block is made from the material with a refractive index of 1.52?



11 Radio waves, visible light and X-rays are all part of the electromagnetic spectrum.

What is the correct order of increasing wavelength?

	shortest wavelength	→	longest wavelength
A	visible light	radio waves	X-rays
B	visible light	X-rays	radio waves
C	X-rays	radio waves	visible light
D	X-rays	visible light	radio waves

12 A sonic 'tape measure' is used to measure the length of a room. It measures a time interval of 0.060 s between transmitting a sound pulse and receiving the echo. The speed of sound in air is 330 m/s.

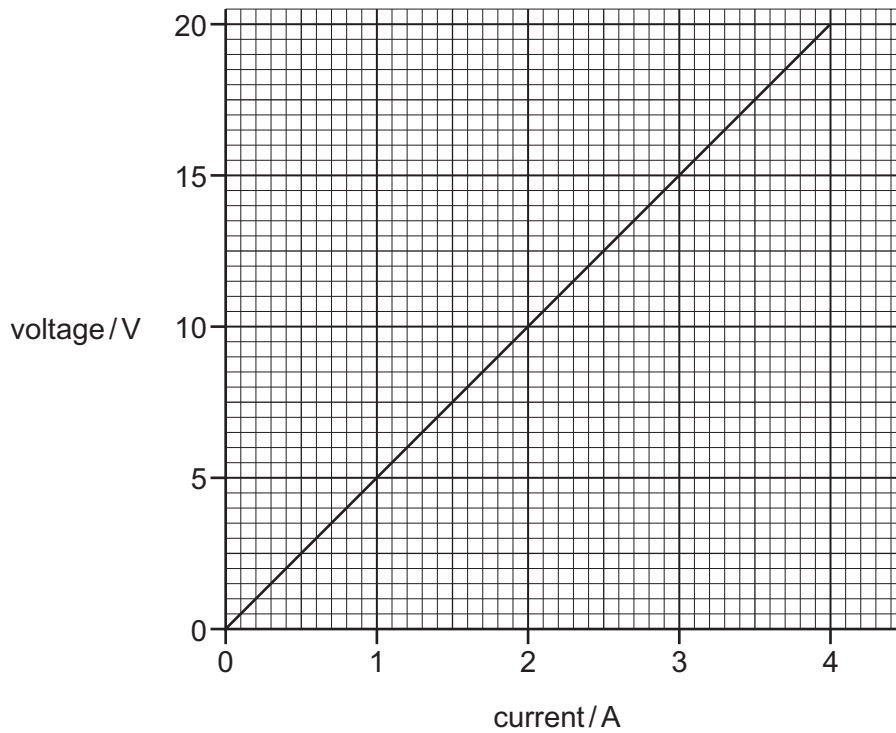
How far is the reflecting wall from the 'tape measure'?

- A** 5.5 m **B** 9.9 m **C** 11 m **D** 20 m

13 How could the unit of potential difference, the volt, also be written?

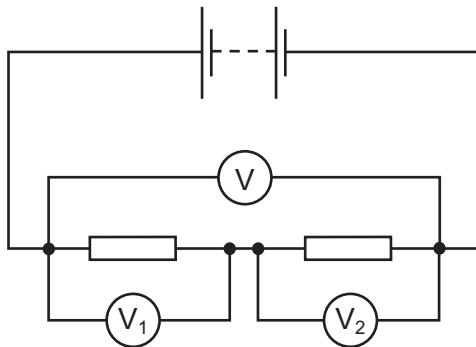
- A** A/s **B** C/A **C** C/J **D** J/C

- 14 The graph shows the results of an experiment to determine the resistance of a wire.



What is the resistance of the wire?

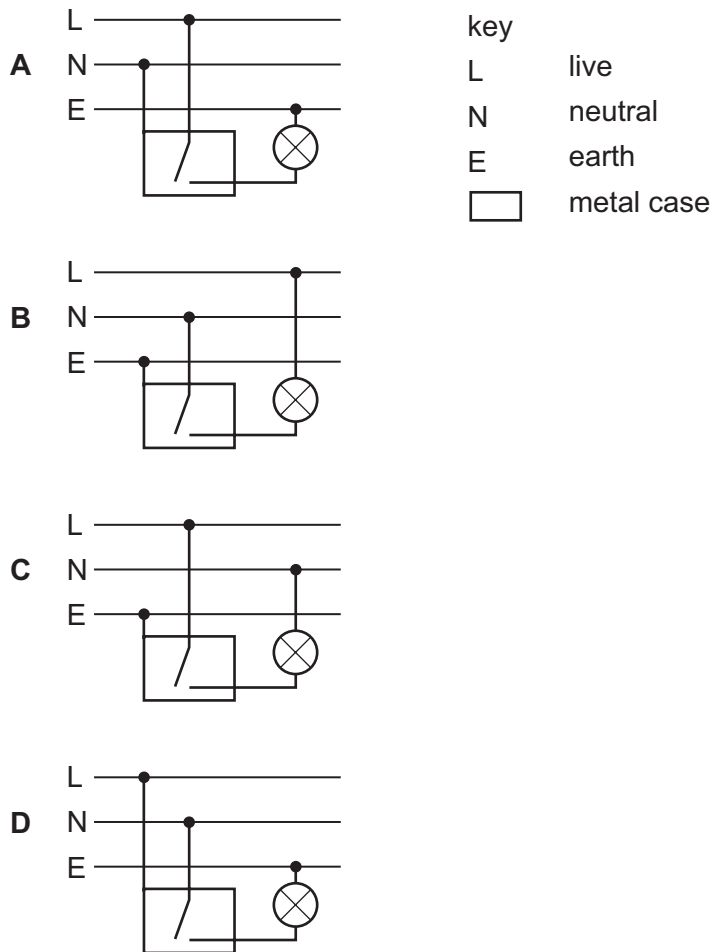
- A** $0.2\ \Omega$ **B** $4.0\ \Omega$ **C** $5.0\ \Omega$ **D** $80\ \Omega$
- 15 The circuit shows three voltmeters being used to measure potential differences in a series circuit.



Which of the following is correct?

- A** $V = V_1 = V_2$
B $V = V_1 + V_2$
C $V = V_1 - V_2$
D $V = V_1 \times V_2$

16 Which diagram shows the correct connections for a switch and a lamp in a lighting circuit?



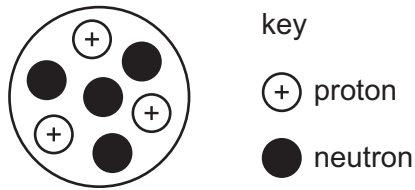
17 What will prove that a metal bar is a permanent magnet?

- A It attracts another magnet.
- B It attracts both ends of a compass needle.
- C It conducts electricity.
- D It repels another magnet.

18 What is the main function of a basic iron-cored transformer?

- A to change d.c. to a.c.
- B to change to a higher or a lower a.c. voltage
- C to provide a constant voltage source
- D to store electrical energy

19 The diagram represents a nucleus of element X.



Which of the following represents the nuclide of this element?

- A ${}^3_4\text{X}$ B ${}^4_3\text{X}$ C ${}^7_3\text{X}$ D ${}^7_4\text{X}$

20 A research worker wants to use a radioactive source with a count rate of 100 counts per second for an experiment he plans to start at 10.00 a.m.

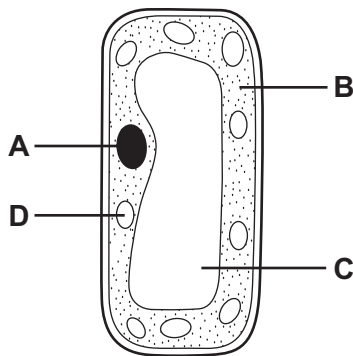
He has four different sources, each of which has a count rate of 400 per second at 9.00 a.m.

Which source should he choose?

- A a source with a half-life of 15 minutes
 B a source with a half-life of 20 minutes
 C a source with a half-life of 30 minutes
 D a source with a half-life of 40 minutes

21 The diagram shows a cell from the leaf of a green plant.

In which part would the chromosomes be found?



22 Which part of the structure of a root hair cell is the site of uptake of water?

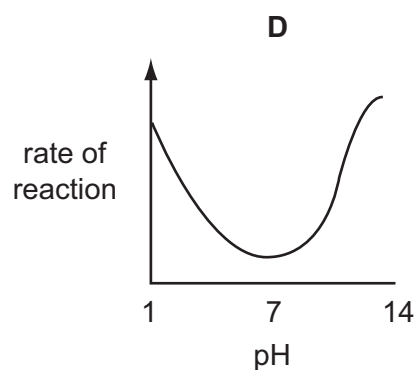
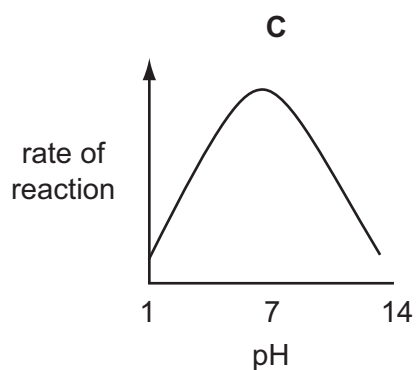
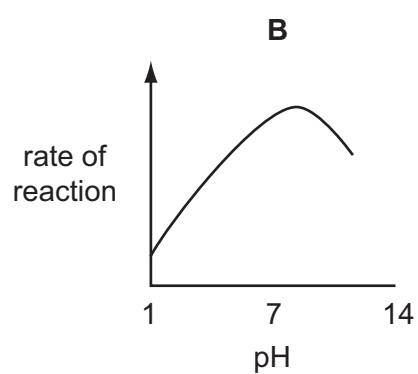
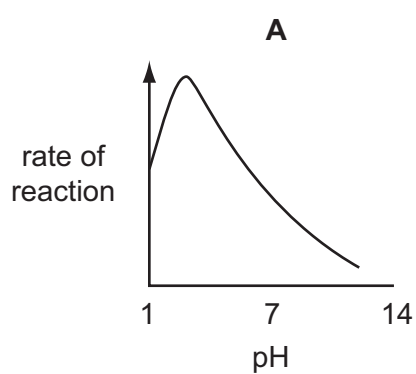
- A cell membrane
 B cell wall
 C cytoplasm
 D sap vacuole

23 Which of these processes **always** involves the movement of water molecules?

	diffusion	osmosis	
A	✓	✓	key
B	✓	✗	✓ yes
C	✗	✓	✗ no
D	✗	✗	

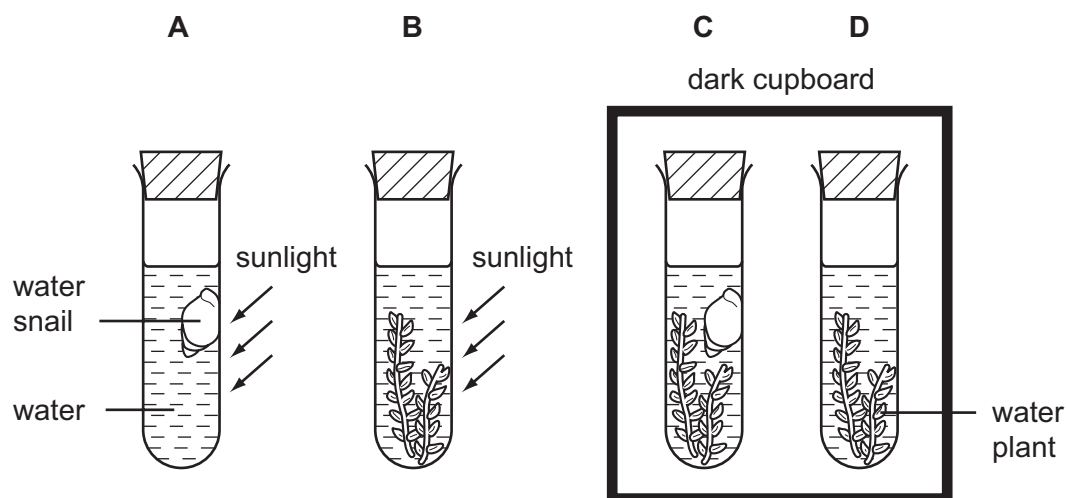
24 Pepsin is an enzyme that is active in the human stomach.

Which graph shows how the rate of reaction of pepsin is affected by pH?



25 An experiment is set up as shown, and left for one hour.

In which test-tube does the concentration of carbon dioxide **decrease**?



26 For which substances, required by plants for growth, do the plants need nitrate ions?

	proteins	starch	sugar
A	✓	x	x
B	✓	✓	x
C	x	✓	✓
D	x	x	✓

key

✓ = nitrate used

x = nitrate not used

27 The recommended diet for soldiers in freezing Arctic conditions is different from that recommended for tropical conditions.

What should the Arctic diet include?

- A less fat
- B less fibre
- C more energy
- D more protein

28 Which processes are functions of the liver?

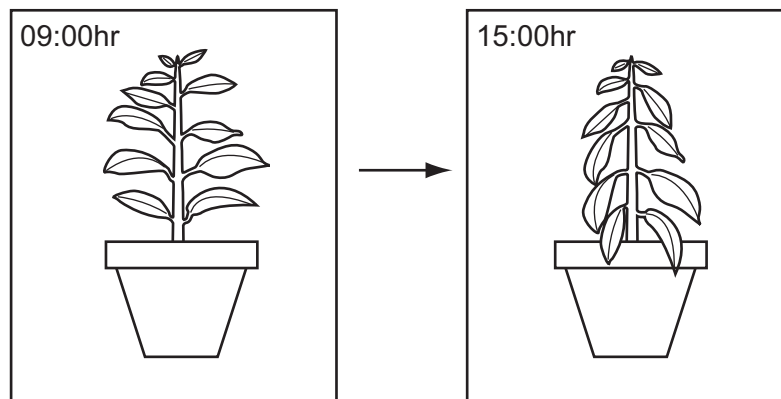
	absorbing food	assimilating food	helping with digestion of food
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✓

key

✓ = is a function

✗ = is not a function

29 A plant is left in the hot sun for six hours.

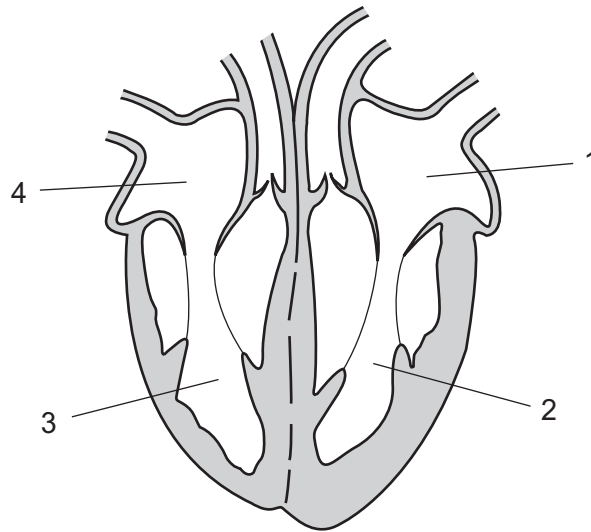


The diagram shows how the appearance of the plant changes during this time.

What explains the change in appearance of the plant?

- A** More water is lost by transpiration than is absorbed.
- B** Stomata have closed.
- C** The concentration of water in the cells has increased.
- D** There is less support provided by the xylem.

30 The diagram shows a section of the heart.

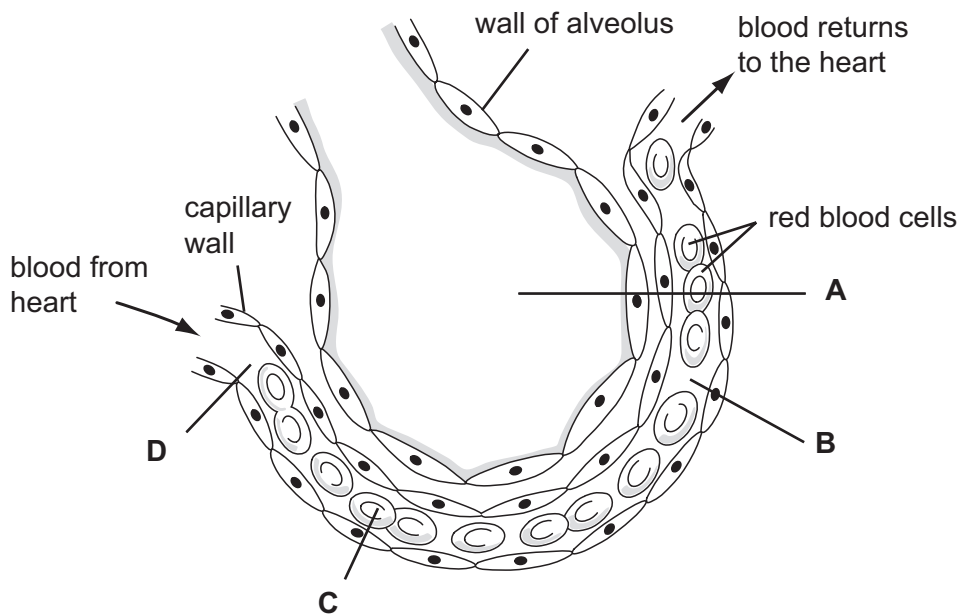


Which two chambers of the heart contain oxygenated blood?

- A** 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

31 The diagram shows a section through an alveolus and an associated blood capillary.

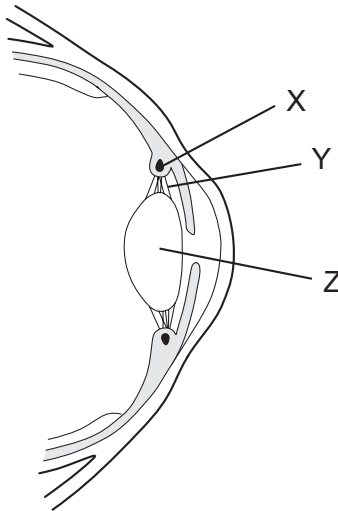
In which part is the concentration of carbon dioxide highest?



32 Which equation represents anaerobic respiration?

- A** glucose \rightarrow lactic acid
B glucose \rightarrow lactic acid + carbon dioxide
C glucose \rightarrow lactic acid + water
D glucose + oxygen \rightarrow carbon dioxide + water

33 The diagram shows a section through part of the eye.



What happens to parts X, Y and Z when the eye focuses on a near object?

	X	Y	Z
A	contracts	tight	less convex
B	contracts	slack	more convex
C	relaxes	tight	less convex
D	relaxes	slack	more convex

34 Many drugs affect the nervous system by acting as depressants.

Which of these drugs are depressants?

	alcohol	heroin
A	✓	✓
B	x	x
C	✓	x
D	x	✓

key
 ✓ = depressant
 x = not a depressant

35 The diagram represents the energy flow through a food chain.



What provides the energy source (X) for this food chain?

- A decomposers
 - B herbivores
 - C plants
 - D sunlight
- 36 In a tropical rainforest which of these processes is linked to the removal of carbon dioxide from the atmosphere?
- A decay
 - B new plant growth
 - C respiration
 - D transpiration
- 37 In recent years, important rivers in many parts of the world have become more acidic.
- What has caused this change?
- A air pollution by sulphur dioxide
 - B water pollution by inorganic waste
 - C increased use of insecticides
 - D increased use of nitrate fertilisers
- 38 What will be most likely to produce flowers of the same type and colour?
- A growing plants from the seeds of one parent
 - B growing plants that have been produced by asexual reproduction
 - C growing plants at the same temperature
 - D growing plants in the same light intensity
- 39 How does a human female gamete differ from a male gamete?
- A The human female gamete contains a Y chromosome.
 - B The human female gamete is a ball of cells.
 - C The human female gamete is larger.
 - D The human female gamete swims more quickly.

40 How does **continuous** variation differ from discontinuous variation?

	continuous variation has two or more distinct types	continuous variation is controlled by
A	no	few genes
B	no	many genes
C	yes	few genes
D	yes	many genes

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