



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE (PHYSICS, BIOLOGY)

5125/01

Paper 1 Multiple Choice

October/November 2010

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.

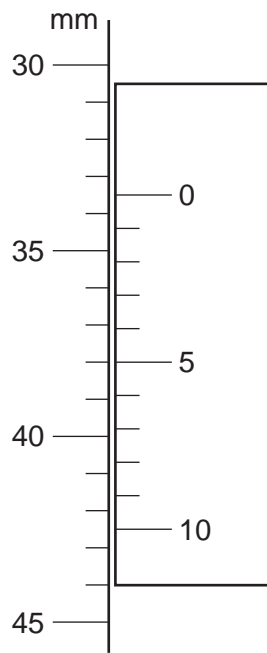
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

This document consists of **15** printed pages and **1** blank page.



- 1 The diagram shows part of a vernier scale.



What is the correct reading?

- A** 30.5 mm **B** 33.5 mm **C** 38.0 mm **D** 42.5 mm
- 2 The gradient of the line on a graph gives the acceleration of a moving object.
- What are the quantities on the horizontal and vertical axes of this graph?

	quantity on horizontal axis	quantity on vertical axis
A	speed	distance
B	speed	time
C	time	distance
D	time	speed

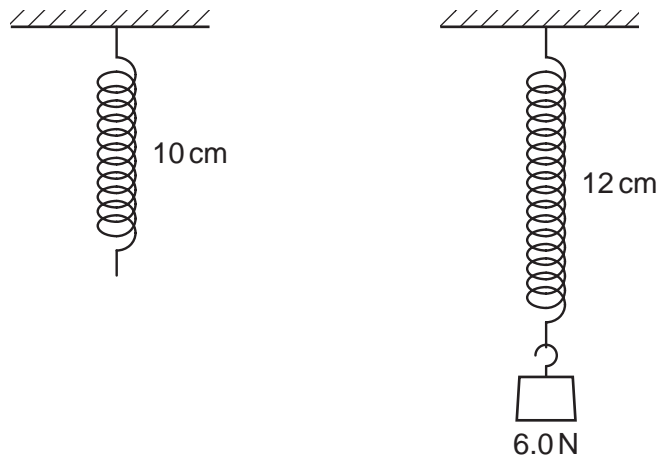
- 3 The gravitational field strength is 2 N/kg on the Moon and 10 N/kg on the Earth.

An astronaut returns from the Moon to the Earth.

What effect does this have on the astronaut's mass and weight?

	mass	weight
A	less on Earth	same on Earth and Moon
B	more on Earth	same on Earth and Moon
C	same on Earth and Moon	less on Earth
D	same on Earth and Moon	more on Earth

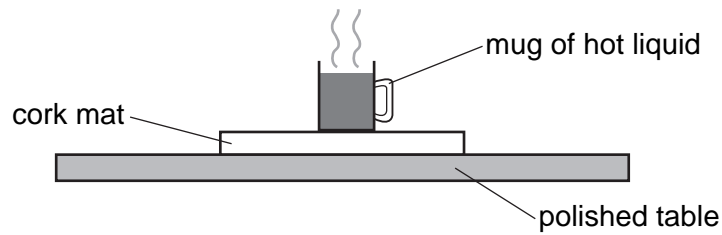
- 4 The diagrams show how a spring extends when a weight of 6.0 N is hung on it.



Which weight hanging from the spring causes the length to become 15 cm?

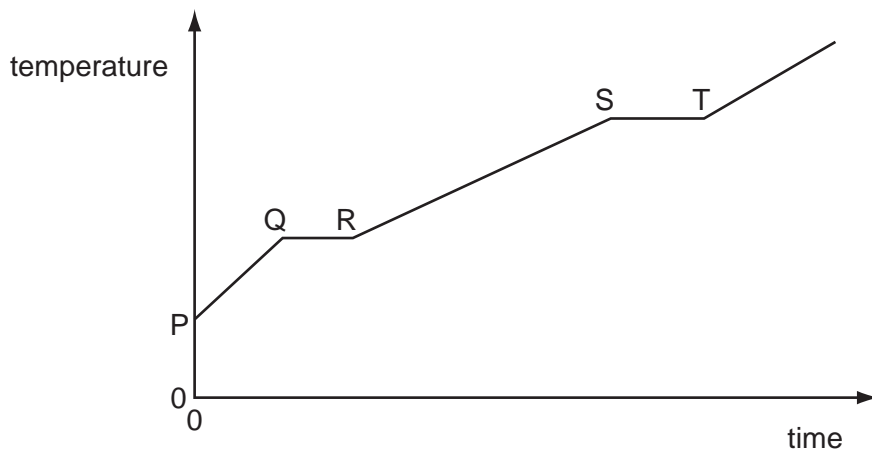
- A** 7.5 N **B** 15 N **C** 30 N **D** 45 N
- 5 A 2 kg mass is moving at constant speed.
The kinetic energy of the mass is 400 J.
What is the speed of the mass?
A 0.4 m/s **B** 20 m/s **C** 200 m/s **D** 400 m/s
- 6 An electric motor lifts a weight of 8 N through a height of 5 m in 4 s.
What is the power developed?
A 2.5 W **B** 6.4 W **C** 10 W **D** 40 W

- 7 To protect a polished table, a cork mat may be put on the table underneath a mug containing hot liquid.



Why is this effective?

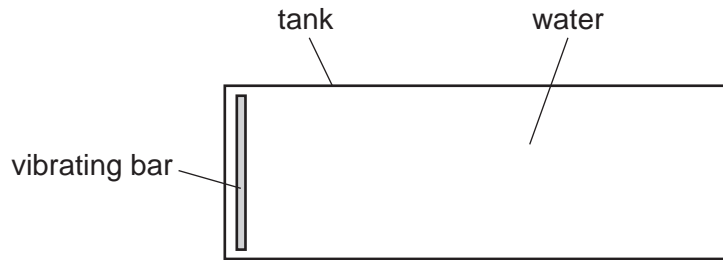
- A** Cork is a good conductor.
B Cork is a good radiator.
C Cork is a poor conductor.
D Cork is a poor radiator.
- 8 The diagram shows the temperature-time graph obtained when a substance, initially solid is heated steadily.



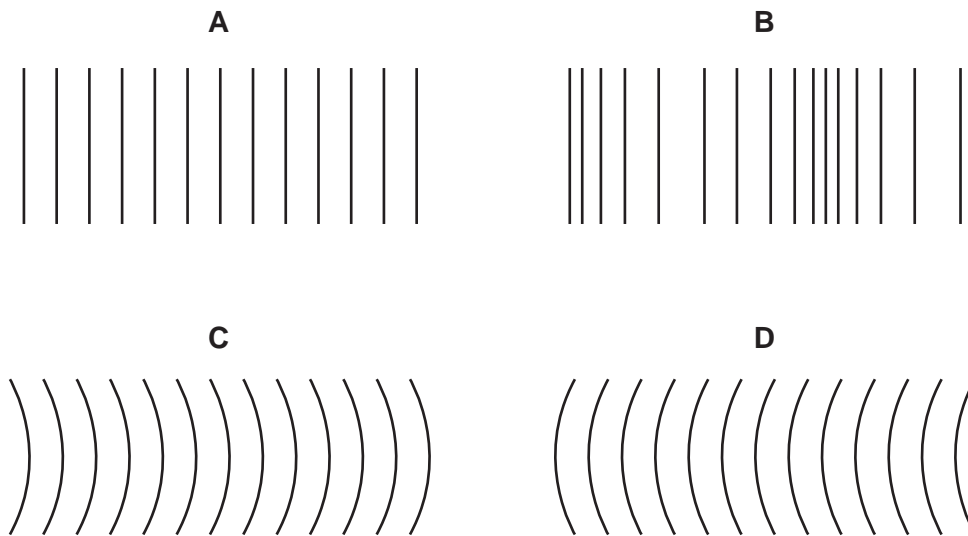
At which stage does boiling occur?

- A** PQ **B** QR **C** RS **D** ST

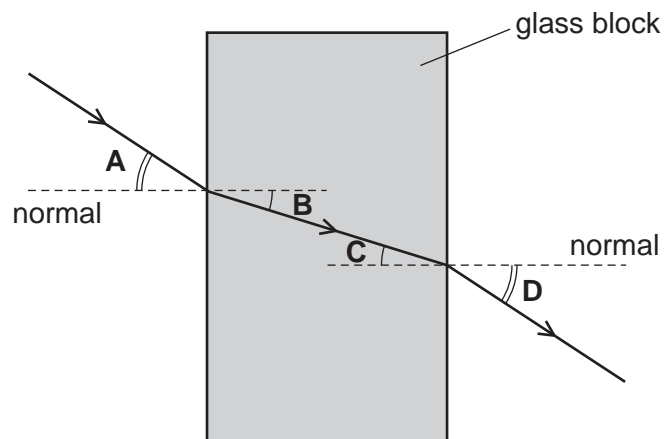
- 9 The diagram shows the view of a ripple tank from above. The bar vibrates up and down at constant frequency to produce waves.



Which wave pattern is seen in the tank?



- 10 What is the angle of refraction for this ray of light moving from glass to air?



- 11 An object is placed 20 cm from a converging lens of focal length 40 cm.

Which describes the nature of the image formed by the lens?

- A real, inverted, diminished
 B real, upright, magnified
 C virtual, inverted, diminished
 D virtual, upright, magnified
- 12 In an experiment to measure the speed of sound in air, a boy stands 40 m from a wall and bangs two pieces of wood together. At the instant he hears the echo, he bangs them together again. He does this many times. The time taken for 50 intervals between bangs is 12 s.

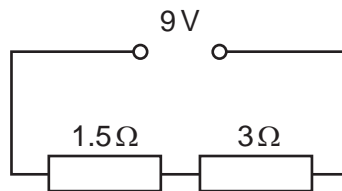
Which calculation gives the speed of sound in air?

- A $\frac{12}{40 \times 50}$ B $\frac{40 \times 50}{12}$ C $\frac{40 \times 2 \times 50}{12}$ D $\frac{40 \times 2 \times 12}{50}$

- 13 Electric current is defined as rate of flow of charge and is measured in amperes, A.

How can the unit of current also be written?

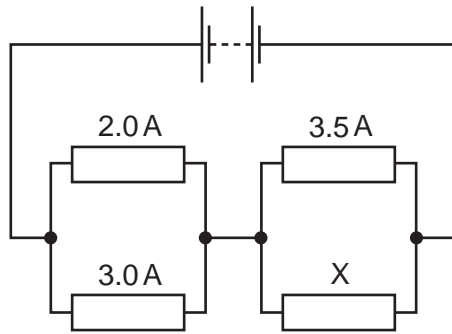
- A Cm B C/m C Cs D C/s
- 14 Two resistors are connected in series with a 9 V supply.



What is the current flowing in the circuit?

- A 2.0 A B 3.0 A C 4.5 A D 6.0 A

- 15 A circuit consists of a battery and four resistors.



The current in three of the resistors is shown.

What is the current in X?

- A** 1.5 A **B** 2.0 A **C** 3.0 A **D** 5.0 A
- 16 The kilowatt-hour is a unit of
- A** charge
B energy
C power
D voltage
- 17 A 2 kW appliance is to be connected to the 240 V mains supply.
- Which fuse should be fitted in the plug?
- A** 1 A **B** 3 A **C** 5 A **D** 10 A
- 18 There are 2000 turns in the secondary coil of a transformer and 500 turns in the primary coil.
- An alternating voltage of 240 V is applied across the primary coil.
- What will be the voltage across the secondary coil?
- A** 60 V **B** 500 V **C** 960 V **D** 2000 V
- 19 What is the nucleon number of a nuclide?
- A** the number of neutrons
B the number of protons
C the total number of neutrons and protons
D the total number of protons and electrons

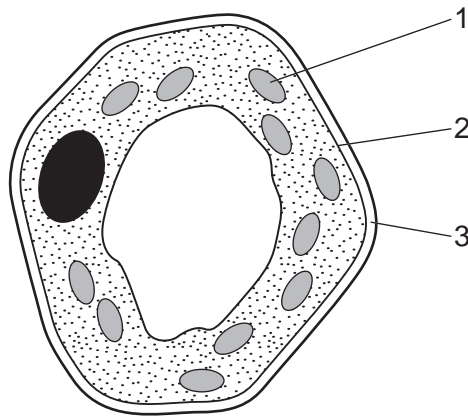
20 A radioactive material gives a count rate of 8000 counts per minute.

After 20 days, it gives a count rate of 500 counts per minute.

What is the half-life of the material?

- A** 4 days **B** 5 days **C** 20 days **D** 80 days

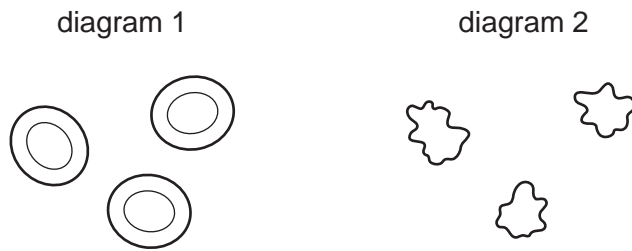
21 The diagram shows a plant cell as seen under a microscope.



What are the functions in the cell of the numbered parts?

	controlling entry of substances	synthesis of carbohydrate
A	1	3
B	2	1
C	3	2
D	3	1

- 22 Diagram 1 represents some red blood cells in a solution of the same water potential as plasma. Diagram 2 shows the same cells after treatment.



Which solution has been used in diagram 2 and in which direction has water moved?

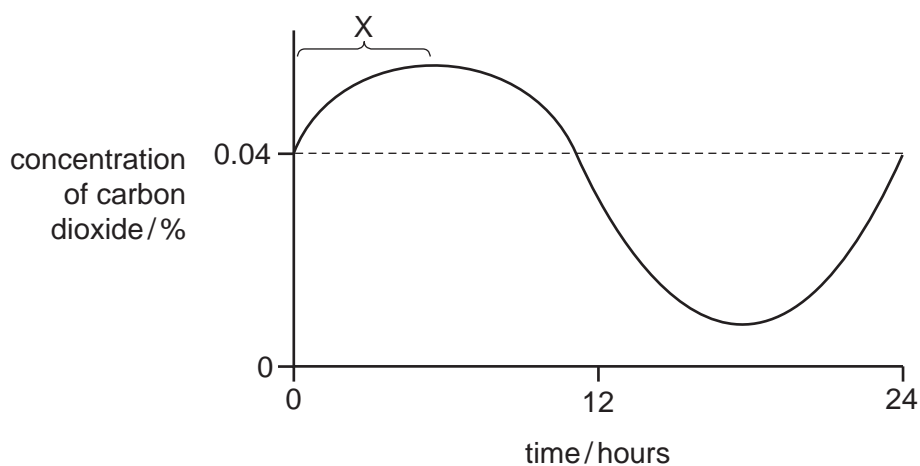
	solution used in diagram 2	direction of water movement
A	higher water potential	into the cells
B	higher water potential	out of the cells
C	lower water potential	into the cells
D	lower water potential	out of the cells

- 23 Which statements are correct for **all** enzymes?

- 1 They are proteins.
- 2 They are secreted into the gut.
- 3 They speed up biochemical reactions.
- 4 None of them work at low pH.

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

- 24 The graph shows the concentration of carbon dioxide in the air surrounding a plant measured over 24 hours.

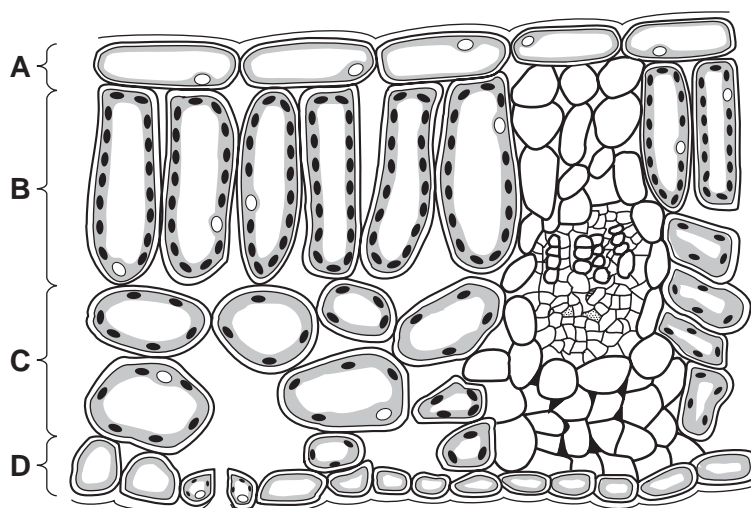


What explains the change in carbon dioxide concentration at X?

	light intensity	plant process
A	darkness	respiration
B	darkness	transpiration
C	daylight	photosynthesis
D	daylight	respiration

- 25 The diagram shows the arrangement of cells in the leaf of a green plant.

In which region do the cells contain the greatest number of chloroplasts?



26 In which order do these events occur in human nutrition?

- A digestion → ingestion → absorption → assimilation
- B digestion → ingestion → assimilation → absorption
- C ingestion → digestion → absorption → assimilation
- D ingestion → digestion → assimilation → absorption

27 The table shows the nutrients in different parts of a meal.

Which food would be most useful in preventing constipation?

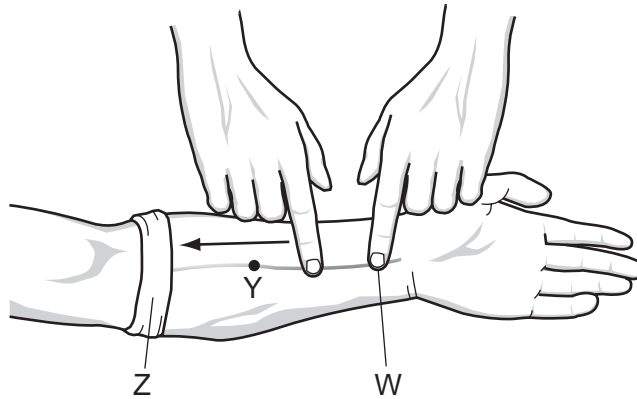
	food	energy kJ	protein g	fat g	carbohydrate g	fibre g
A	cucumber sandwich	1054	19	7.3	27	6.1
B	orange juice	163	0.1	0	9.4	0
C	ripe banana	466	1.5	0.4	27	4.9
D	toffee bar	458	2.1	3.3	19	1.1

28 A green plant starts to wilt. It is then given water, and after a short time it recovers.

Which process causes this recovery?

- A assimilation
- B osmosis
- C respiration
- D transpiration

29 The diagram shows the investigation of blood flow in the veins of the lower arm.



A cloth is tightly wrapped round the arm at point Z and the veins stand out clearly. One finger presses on the vein at W.

When another finger strokes the vein, as shown in the diagram, the vein lies flat between points W and Y.

Some possible explanations are listed.

- 1 The bandage at Z prevents backflow of blood.
- 2 The finger pressed at W prevents more blood entering the vein.
- 3 A valve at Y prevents backflow.
- 4 A valve at Z prevents more blood from entering the vein.

Which explanations of the vein lying flat are correct?

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

30 Why is the percentage of nitrogen in inspired air more than in expired air?

- A** Ciliated cells in the bronchus absorb nitrogen.
B Nitrogen is absorbed into the blood in the alveoli.
C The expired air is mainly carbon dioxide.
D There is an increase in water vapour in expired air.

31 Which feature of alveoli means that there is only a short distance for diffusion of oxygen and carbon dioxide?

- A** Each alveolus has a large blood supply.
B Each alveolus has a moist surface.
C There are approximately 150 million alveoli in each lung.
D The walls of the alveoli are one cell thick.

32 Where are most nitrogen compounds excreted from humans?

- A kidneys
- B liver
- C rectum
- D skin

33 The eye changes focus from looking at a wrist watch to looking at an aeroplane flying overhead. What changes occur inside the eye?

	shape of lens	suspensory ligaments	ciliary muscles
A	thicker	slacken	contract
B	thicker	taut	relax
C	thinner	slacken	contract
D	thinner	taut	relax

34 Which statements about alcohol are correct?

	acts as a depressant	speeds up reaction times	may damage the liver
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

key

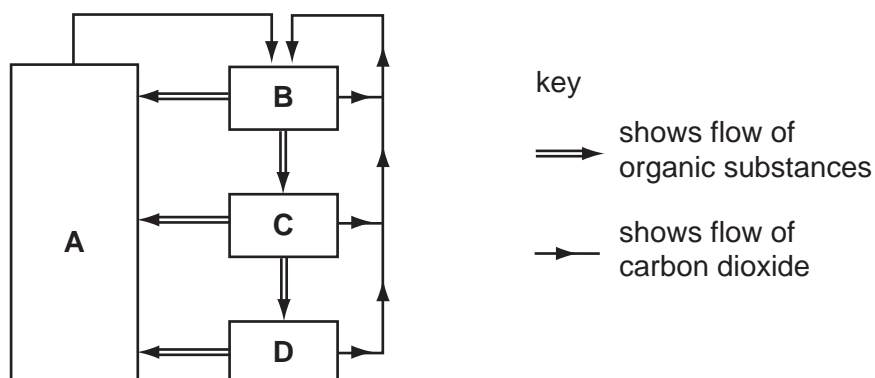
✓ = correct

✗ = incorrect

35 The diagram represents the flow of substances within a balanced ecosystem.

The boxes are various trophic levels.

Which box represents herbivores?



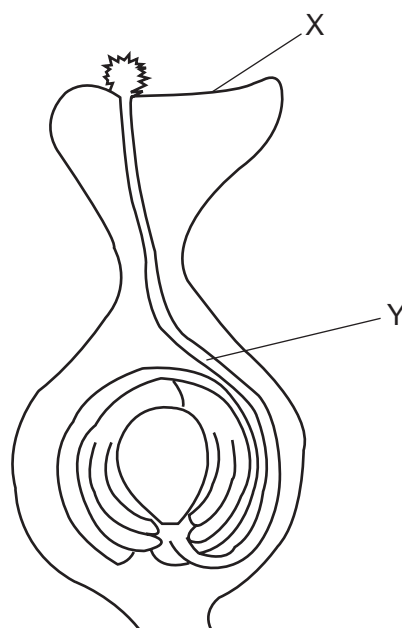
36 Which processes increase and decrease the amount of carbon dioxide in the air?

	process causing increase in carbon dioxide	process causing decrease in carbon dioxide
A	burning of fossil fuels	respiration of plants
B	photosynthesis in plants	respiration of bacteria
C	respiration of animals	photosynthesis in plants
D	respiration of bacteria	burning of fossil fuels

37 What is a long-term effect of cutting down large areas of rain forest?

- A** decreased carbon dioxide in the air
- B** decreased flooding of low-lying land
- C** increased rainfall in these areas
- D** increased rate of soil erosion

38 The diagram shows the carpel of a flower soon after pollination.



What are the labelled structures?

	X	Y
A	stamen	pollen grain
B	stamen	pollen tube
C	stigma	pollen grain
D	stigma	pollen tube

39 Which diseases can be cured with antibiotics?

	gonorrhoea	HIV infection	syphilis
A	✓	✓	✓
B	✓	x	✓
C	x	✓	x
D	x	x	✓

key

✓ = can be cured with antibiotics

x = cannot be cured with antibiotics

40 Which human feature is an example of continuous variation?

- A** blood group
- B** foot size
- C** sex
- D** types of teeth

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