

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE (PHYSICS, BIOLOGY)

5125/01

Paper 1 Multiple Choice

October/November 2005

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.

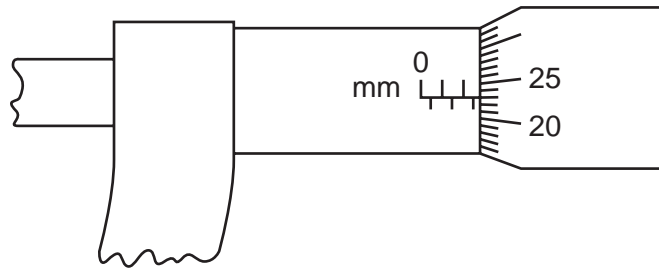
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

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

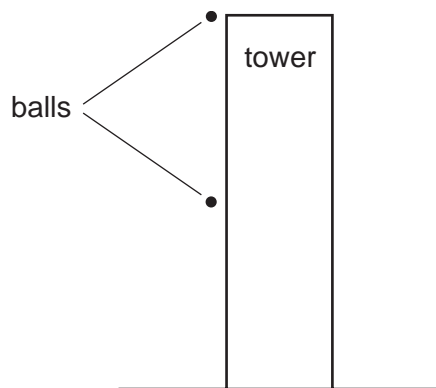


- 1 The diagram shows a micrometer.



Which reading is shown?

- A** 2.23 mm **B** 2.73 mm **C** 3.23 mm **D** 5.23 mm
- 2 Two identical balls are released from a tower at the same time. Initially at rest, one falls from the top of the tower and the other from half way.



Which quantity is the same for both balls?

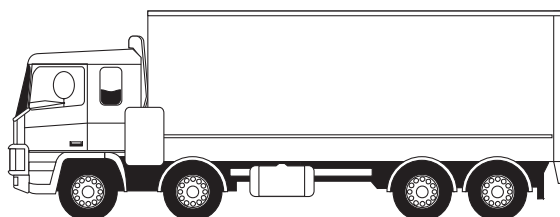
- A** acceleration
B final speed
C time of travel
D total increase in velocity
- 3 A block of mass 20 kg is pushed along a road with a force of 30 N. The frictional force is 10 N.



What is the acceleration of the block?

- A** 0.67 m/s^2 **B** 1.0 m/s^2 **C** 1.5 m/s^2 **D** 2.0 m/s^2

- 4 The diagram shows a lorry.



What is the best position for its centre of gravity and why is it placed there?

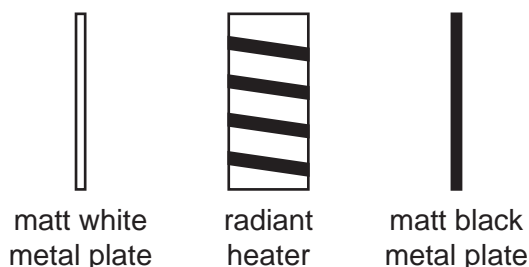
	best position	reason for the position
A	as high as possible	the lorry can accelerate more rapidly
B	as high as possible	the lorry is more stable
C	as low as possible	the lorry can accelerate more rapidly
D	as low as possible	the lorry is more stable

- 5 A body moving with a speed of 30 m/s has a kinetic energy of 1800 J.

What is its mass?

- A** 120 kg **B** 60 kg **C** 4 kg **D** 2 kg

- 6 Two identical metal plates are painted, one matt white and the other matt black. These are placed at equal distances from a radiant heater as shown. The heater is turned on for five minutes.

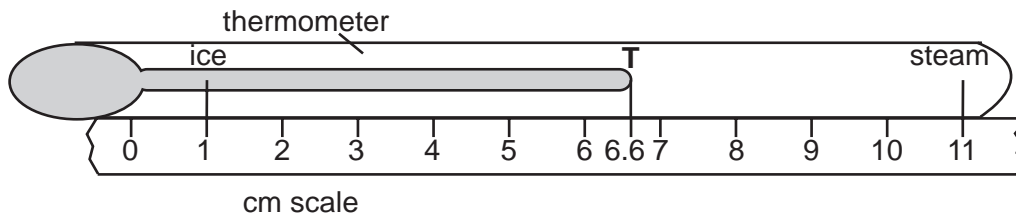


Which metal plate absorbs more energy and which plate emits more energy in this time?

	absorbs more	emits more
A	black	black
B	black	white
C	white	black
D	white	white

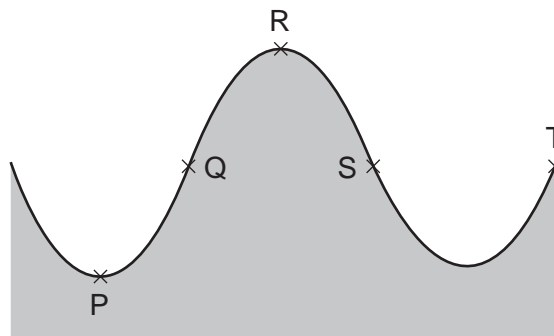
- 7 A cm scale is fixed next to an unmarked mercury-in-glass thermometer.

The ice point and the steam point are marked.



What is the temperature if the mercury is at T?

- A** 44°C **B** 56°C **C** 60°C **D** 66°C
- 8 The diagram shows waves travelling on the sea.



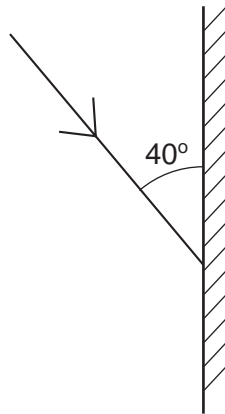
Which points are one wavelength apart?

- A** P and R **B** Q and S **C** Q and T **D** S and T
- 9 A surf-board moves at a speed of 5 m / s on the crest of a wave. The distance between successive wave crests is 10 m.

What is the frequency of the wave motion?

- A** 0.5 Hz **B** 2 Hz **C** 5 Hz **D** 10 Hz

- 10 The diagram shows a single ray of light being directed at a plane mirror.



What are the angles of incidence and reflection?

	angle of incidence	angle of reflection
A	40°	40°
B	40°	50°
C	50°	40°
D	50°	50°

- 11 What is the approximate range of audible frequencies for a young person?

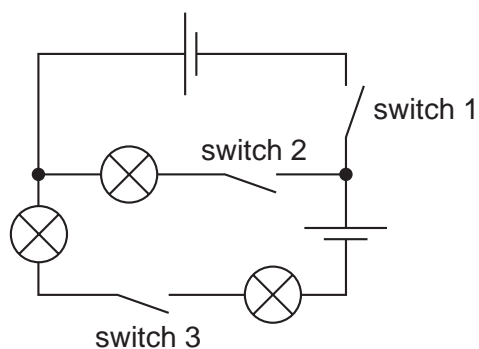
- A** 1 Hz to 2 kHz
- B** 20 Hz to 20 kHz
- C** 20 kHz to 200 kHz
- D** 1000 kHz to 20 000 kHz

- 12 A battery moves a charge of 60 C around a circuit in a time of 20 s.

What is the average current in the circuit?

- A** 0.3 A
- B** 3.0 A
- C** 40 A
- D** 1200 A

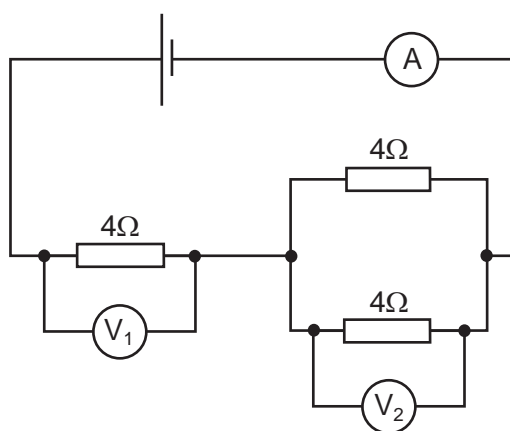
13 A circuit is set up as shown.



Which switch setting lights all three lamps?

	switch 1	switch 2	switch 3
A	closed	closed	open
B	closed	open	closed
C	open	closed	closed
D	open	closed	open

14 In the circuit shown the reading on the ammeter is 1 A.



What would be the readings shown by the voltmeters V_1 and V_2 ?

	V_1	V_2
A	2 V	2 V
B	2 V	4 V
C	4 V	4 V
D	4 V	2 V

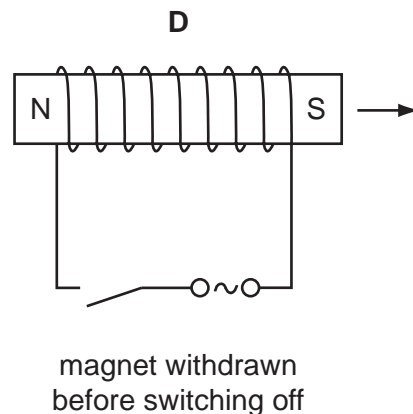
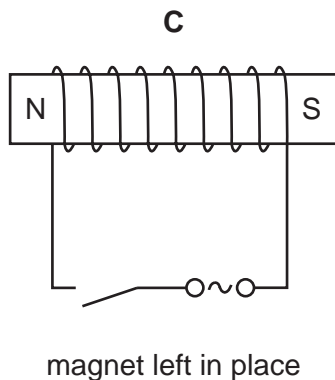
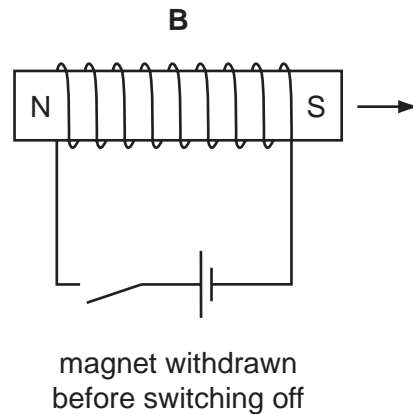
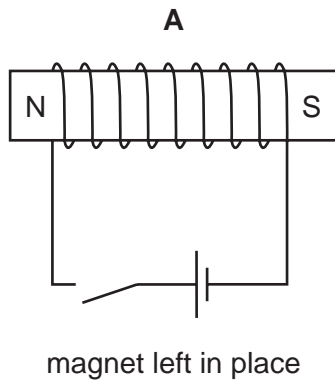
- 15** A person uses a 3 kW electric fire for 2 hours and a 2 kW heater for 4 hours.

What is the total cost if the price of electrical energy is 5.0 cents per unit (kilowatt-hour)?

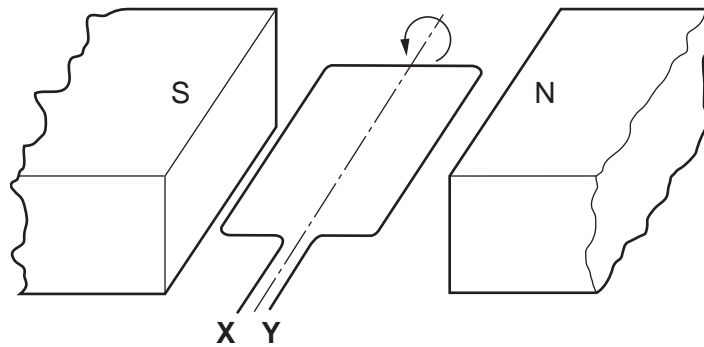
- A** 70 cents **B** 60 cents **C** 40 cents **D** 30 cents

- 16** A permanent magnet can be demagnetised by using a solenoid and switching the current on then off.

Which diagram shows the most effective method of producing demagnetisation?



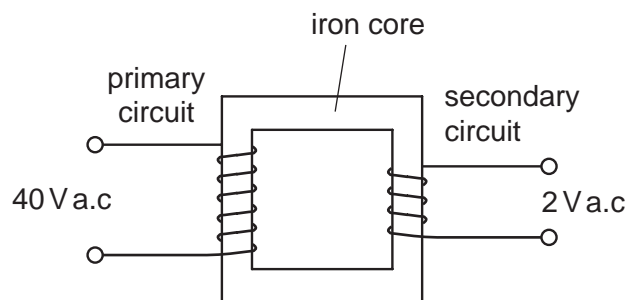
17 The diagram shows a coil in a magnetic field.



When the coil is part of an a.c. generator, what must be connected directly to **X** and **Y**?

- A** a.c. supply
- B** carbon brushes
- C** slip rings
- D** soft-iron core

18 The diagram shows a transformer which is 100 % efficient. The primary current is 0.5A.



What will be the secondary current?

- A** 0.025 A
- B** 0.5 A
- C** 1 A
- D** 10 A

19 Which table correctly identifies the locations of protons, neutrons and electrons in an atom?

A

	nucleus	
	inside	outside
electrons	✓	
neutrons	✓	
protons		✓

B

	nucleus	
	inside	outside
electrons		✓
neutrons	✓	
protons	✓	

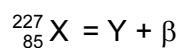
C

	nucleus	
	inside	outside
electrons	✓	
neutrons		✓
protons		✓

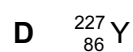
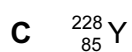
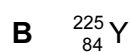
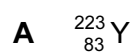
D

	nucleus	
	inside	outside
electrons		✓
neutrons		✓
protons	✓	

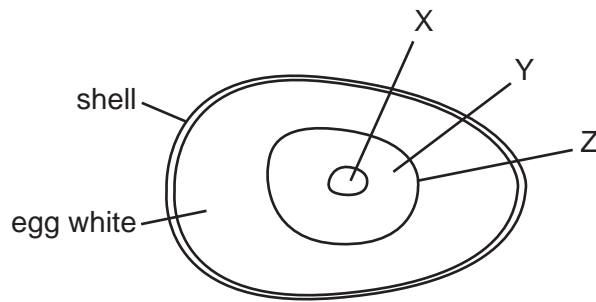
20 A radioactive nucleus X, decays by emitting a beta-particle to form a nucleus, Y.



What represents nucleus Y?



- 21 The yellow part of a hen's egg is a large cell containing a lot of yolk. The diagram shows an unfertilised hen's egg.



What do the labels represent?

	cell membrane	cytoplasm	nucleus
A	X	Y	Z
B	X	Z	Y
C	Z	X	Y
D	Z	Y	X

- 22 A mature xylem vessel in a woody plant has

- A** a cell wall only.
- B** a cell wall and a vacuole.
- C** a cell membrane, cytoplasm and a nucleus.
- D** cytoplasm, a cell wall and a nucleus.

- 23 A piece of plant tissue is transferred from a beaker of water into a 10 % sucrose solution.

What happens?

	movement of water	volume of tissue cells
A	enters the cells	decreases
B	enters the cells	increases
C	leaves the cells	decreases
D	leaves the cells	increases

24 Under which conditions does amylase act on starch most quickly?

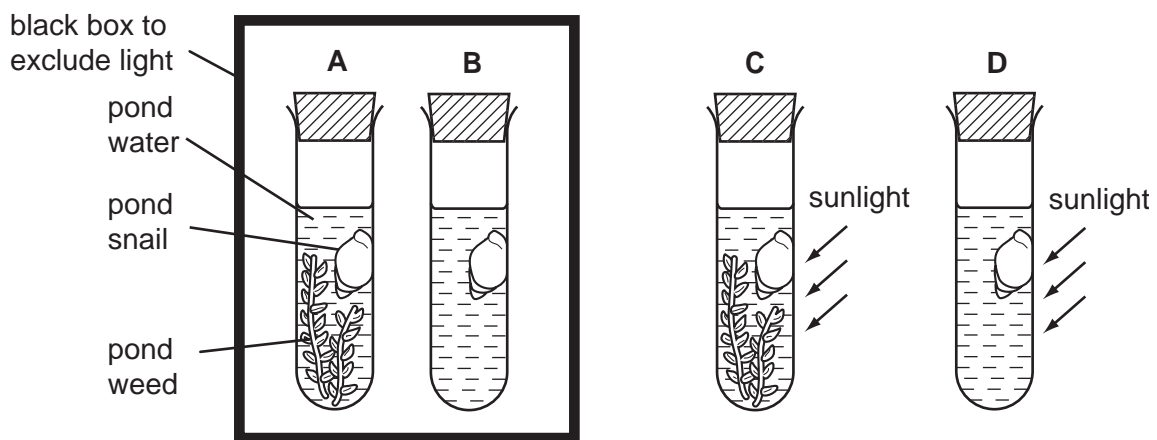
	pH	temperature
A	acidic	30 °C
B	acidic	60 °C
C	neutral	30 °C
D	neutral	60 °C

25 What is the function of chlorophyll in plants?

- A** to absorb carbon dioxide
- B** to absorb light
- C** to absorb oxygen
- D** to absorb water

26 Four test-tubes are set up as shown.

In which test-tube will the concentration of carbon dioxide increase most rapidly?



27 Why is it important to include fibre in the diet?

- A** It gives energy to keep the body warm.
- B** It helps food pass through the gut.
- C** It increases growth in young children.
- D** It is easy to digest.

28 Where in the alimentary canal is most water absorbed?

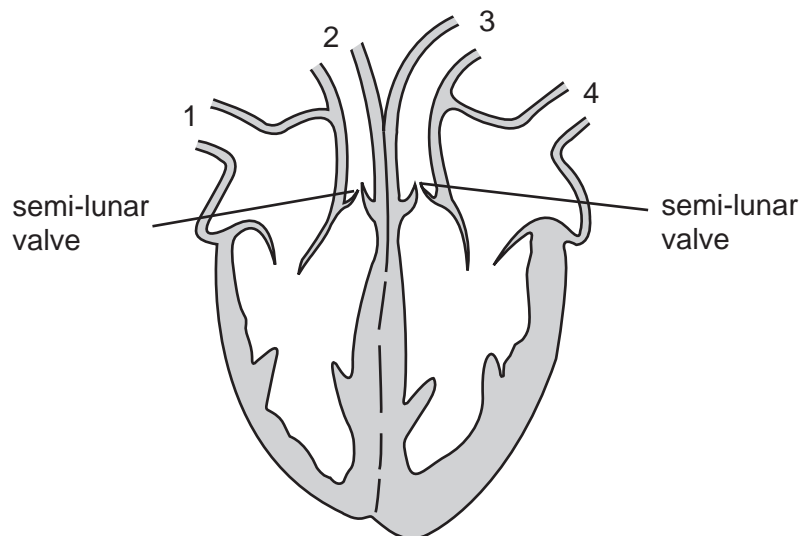
- A colon
- B ileum
- C oesophagus
- D stomach

29 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

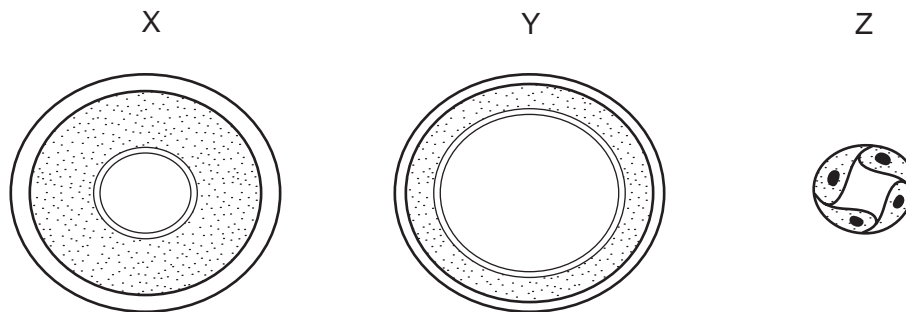
30 The diagram shows a section through the human heart.



What happens as blood is being pumped to the lungs?

	semi-lunar valves	vessel through which blood passes to the lungs
A	closed	4
B	closed	3
C	open	2
D	open	1

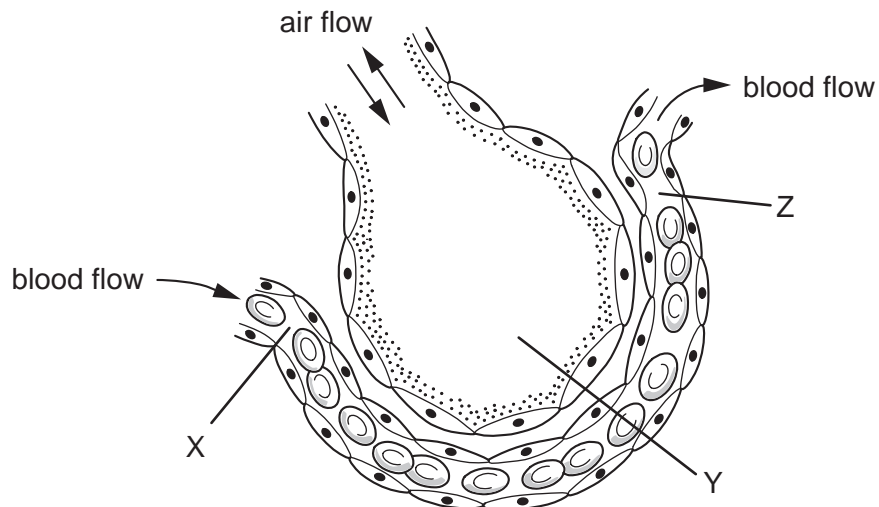
31 The diagram shows cross-sections of three types of blood vessel, not drawn to the same scale.



What are X, Y and Z?

	X	Y	Z
A	artery	capillary	vein
B	artery	vein	capillary
C	vein	artery	capillary
D	vein	capillary	artery

32 The diagram shows a section of an alveolus and a capillary in a lung.



What are the relative concentrations of **carbon dioxide** at X, Y and Z?

	X	Y	Z
A	high	high	high
B	high	low	low
C	low	high	high
D	low	high	low

33 A person is sitting in a dark room.

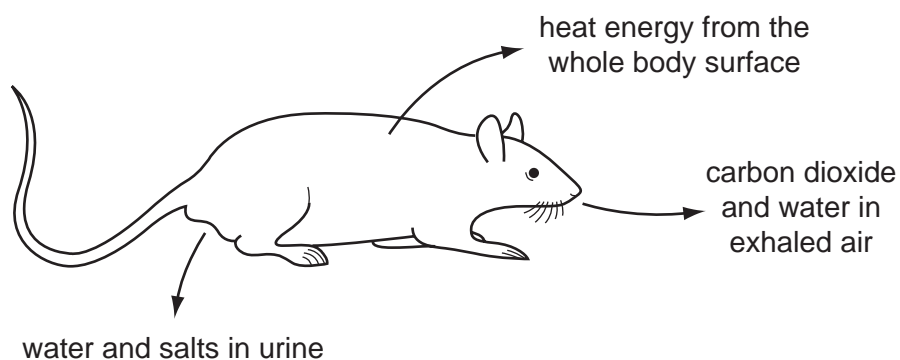
What happens in the eye when a light is switched on?

	circular muscle of iris	size of pupil
A	contracts	decreases
B	contracts	increases
C	relaxes	decreases
D	relaxes	increases

34 Which statement is true of heroin and also true of excessive use of alcohol?

- A** Their use can lead to habitual criminal behaviour.
- B** They are stimulants.
- C** They are usually taken by injection.
- D** They produce only mild withdrawal symptoms.

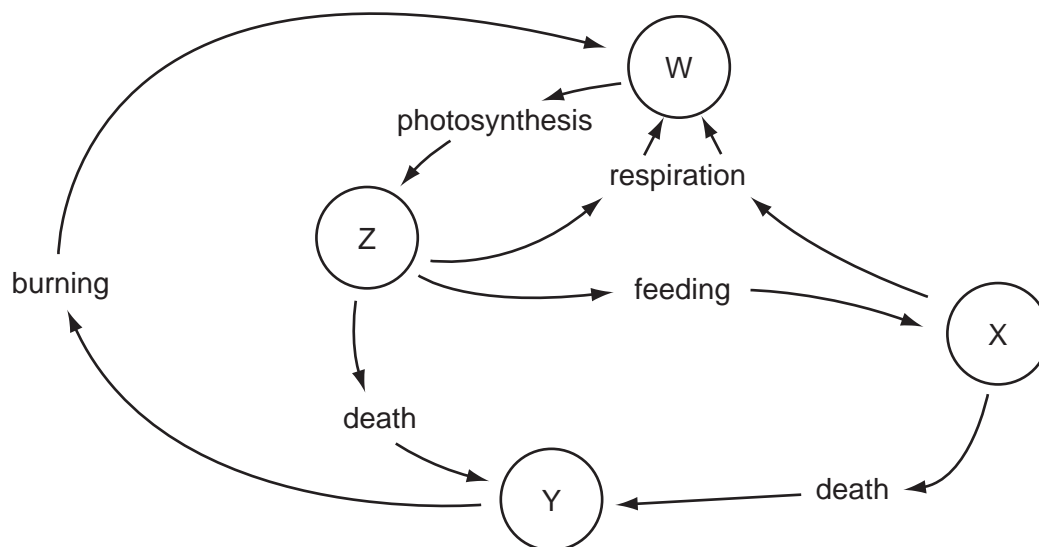
35 The diagram shows losses from a rat to the environment.



What will **not** be returned to the ecosystem and recycled?

- A** carbon dioxide
- B** heat energy
- C** salts
- D** water

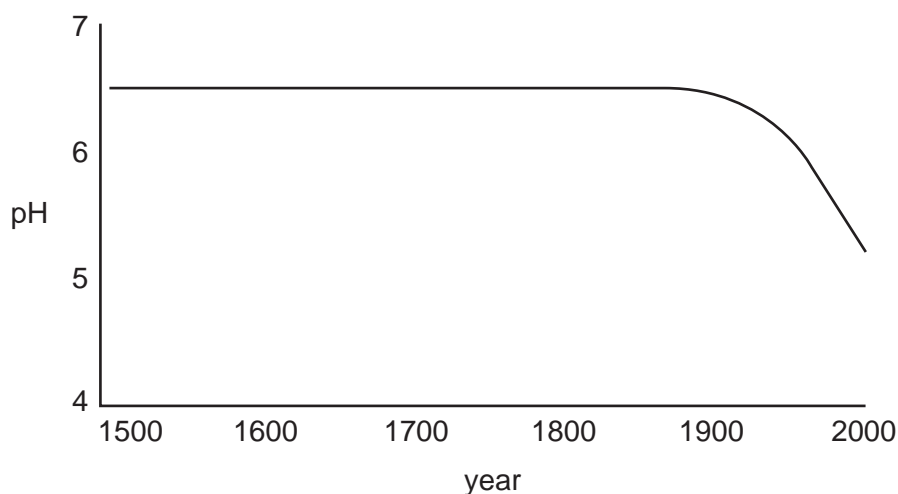
36 The diagram shows some stages in the carbon cycle. W, X, Y and Z are carbon compounds.



What is W?

- A carbon compounds in animals
- B carbon compounds in plants
- C carbon dioxide
- D coal and oil

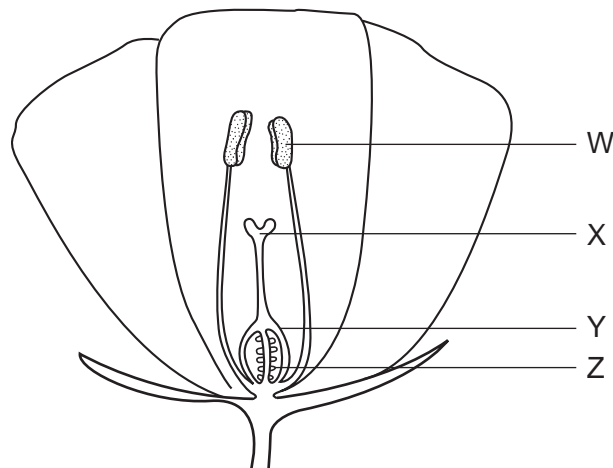
37 The graph shows how the pH of a lake has changed in the period 1500 AD to 2000 AD.



What could have caused the change in the pH over the last 100 years?

- A burning of fossil fuels in factories
- B conversion of nearby woodlands to agricultural land
- C increased growth of plants in the lake
- D use of insecticides on nearby fields

38 The diagram shows a section through a flower.



What are the names of the labelled structures?

	W	X	Y	Z
A	anther	stigma	ovary	ovule
B	anther	stigma	ovule	ovary
C	stigma	anther	ovary	ovule
D	stigma	anther	ovule	ovary

39 Which line indicates hormonal and mechanical birth control methods?

	hormonal	mechanical
A	pill	spermicide
B	pill	intra-uterine device (IUD)
C	condom	spermicide
D	condom	intra-uterine device (IUD)

40 A human cell contains all of the following.

Which is the smallest in size?

- A** gene
- B** nucleus
- C** X-chromosome
- D** Y-chromosome

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