



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

SCIENCE (PHYSICS, BIOLOGY)

5125/01

Paper 1 Multiple Choice

October/November 2009

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 **12** printed pages.

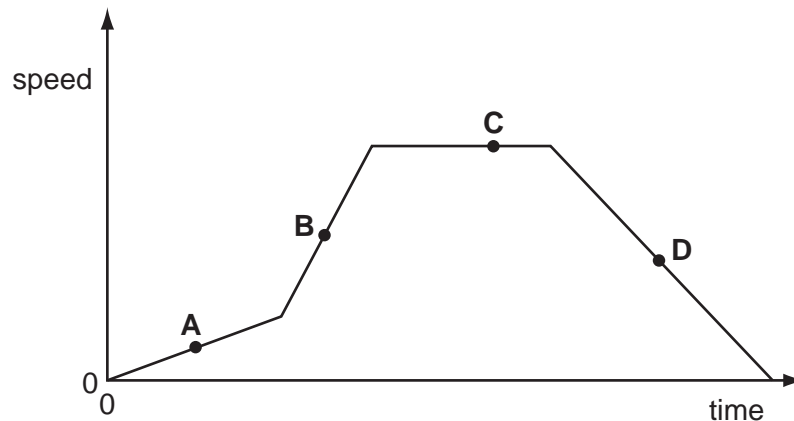


1 What gives the most accurate value for the internal diameter of a test tube?

- A a measuring tape
- B a metre rule
- C a micrometer screw gauge
- D vernier calipers

2 The speed-time graph shows the journey of a train.

At which point does the acceleration have its highest value?

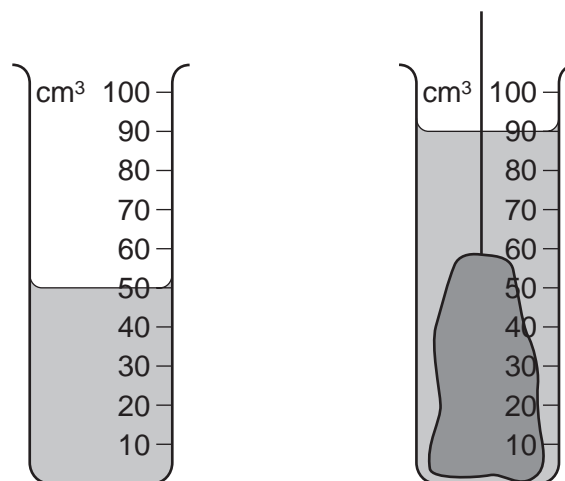


3 A horizontal force of 8 N is applied to a block of mass 2 kg, resting on a frictionless table.

What is the acceleration of the block?

- A 0.25 m/s^2
- B 4.0 m/s^2
- C 6.0 m/s^2
- D 16 m/s^2

4 An object of mass 100 g is immersed in water as shown in the diagram.



What is the density of the material from which the object is made?

- A 0.4 g/cm^3
- B 0.9 g/cm^3
- C 1.1 g/cm^3
- D 2.5 g/cm^3

- 5 If a nut and bolt are difficult to undo, it may be easier to turn the nut by using a longer spanner.

This is because the longer spanner gives

- A a larger turning moment.
- B a smaller turning moment.
- C less friction.
- D more friction.

- 6 A crane lifts a concrete block, whose weight is 60 000 N, to a height of 20 m in 30 s.

What power is achieved by the crane?

- A 100 W B 4000 W C 40 000 W D 90 000 W

- 7 The earliest Ford cars were always painted black. This was because black paint dried more quickly than lighter colours when the cars were left in the sun to dry.

Which property of black paint makes it dry more quickly?

- A It is the best absorber of heat.
- B It is the best conductor of heat.
- C It is the best insulator of heat.
- D It is the best reflector of heat.

- 8 The volume of a fixed mass of liquid can be used to measure temperature.

Why is this?

- A It can be coloured.
- B It expands when it is heated.
- C It is a poor conductor of heat.
- D It is cheap.

- 9 The frequency of a certain v.h.f. radio transmitter is 2×10^8 Hz.

The speed of the waves is 3×10^8 m/s.

What is the wavelength?

- A 0.67 m B 1.0 m C 1.5 m D 6.0 m

- 10** A ray of light travels from air into glass. The refractive index of the glass is 1.5.

Which of the following pairs could be values of the angle of incidence and the angle of refraction?

	angle of incidence	angle of refraction
A	21.5°	20.0°
B	40.0°	30.0°
C	60.0°	35.3°
D	80.0°	53.3°

- 11** 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

- 12** An electrical quantity is defined as 'the energy dissipated by a source in driving unit charge round a complete circuit.'

What is this quantity called?

- A** current
B electromotive force
C potential difference
D power

- 13** A wire has a resistance of $8\ \Omega$. A second wire, made of the same material, has half the length and twice the cross-sectional area.

What is the resistance of the second wire?

- A** $1\ \Omega$ **B** $2\ \Omega$ **C** $8\ \Omega$ **D** $16\ \Omega$

- 14** A set of lights consists of 40 identical lamps connected in series to a 240 V mains supply.

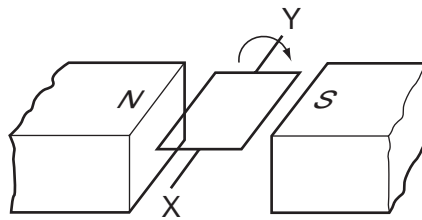
What is the potential difference across each lamp?

- A** 6 V **B** 40 V **C** 240 V **D** 9600 V

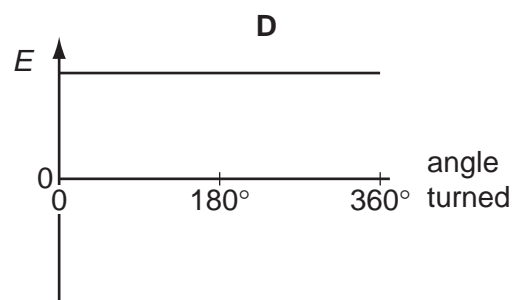
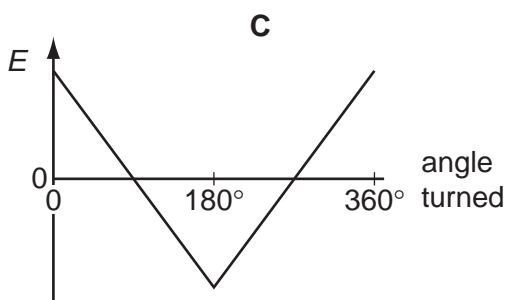
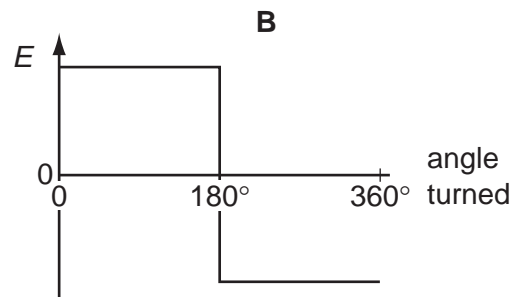
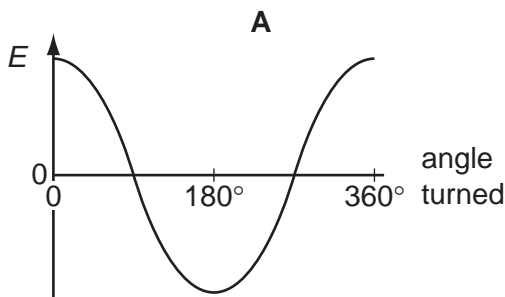
- 15** An electric kettle is plugged in and switched on. The fuse in the plug blows immediately.

Which single fault could cause this?

- A** The earth wire is not connected to the kettle.
 - B** The live wire and neutral wire connections in the plug are swapped around.
 - C** The live wire touches the metal case of the kettle.
 - D** The wires connected to the plug are too thin.
- 16** In a simple a.c. generator, a coil is rotated about a horizontal axis XY between the poles of two bar magnets.



Which graph shows the e.m.f., E , induced in the coil during one complete revolution?



- 17** Which statement about the action of a transformer is correct?

- A** An e.m.f. is induced in the secondary coil when an alternating voltage is applied to the primary coil.
- B** An e.m.f. is induced in the secondary coil when there is a steady direct current in the primary coil.
- C** The current in the secondary coil is always larger than the current in the primary coil.
- D** The voltage in the secondary coil is always larger than the voltage in the primary coil.

- 18 Two nuclides of neon are represented by the symbols below.



One nuclide contains more particles than the other.

What are these extra particles?

- A electrons
 - B ions
 - C neutrons
 - D protons
- 19 Radioactive decay occurs in some nuclei.

Which word describes these nuclei?

- A expanding
 - B neutral
 - C stable
 - D unstable
- 20 The half-life of a radioactive material is 24 years.

The activity of a sample falls to a fraction of its initial value after 72 years.

What is the fraction?

- A $\frac{1}{3}$ B $\frac{1}{4}$ C $\frac{1}{6}$ D $\frac{1}{8}$

- 21 The table shows some characteristics of four types of cell.

Which cell could be a root hair cell?

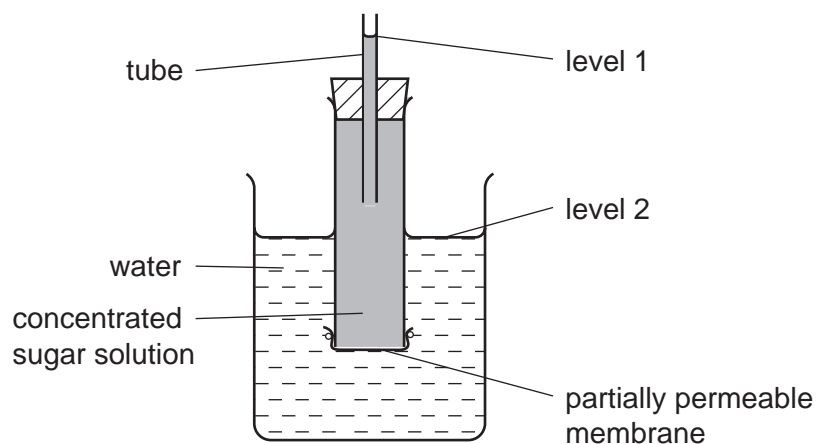
	nucleus	chloroplast
A	✓	✓
B	✓	x
C	x	✓
D	x	x

key

✓ = present

x = absent

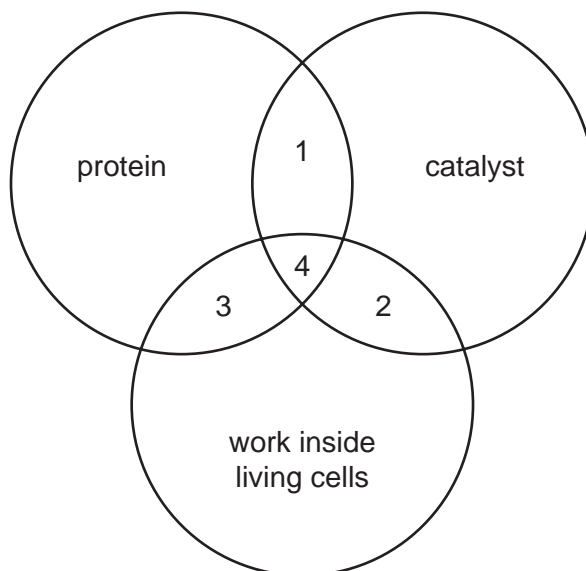
22 The diagram shows apparatus used to investigate osmosis.



Which molecules will move across the partially permeable membrane and which changes in levels will occur?

	molecules	level 1	level 2
A	sugar	fall	rise
B	water	fall	rise
C	sugar	rise	fall
D	water	rise	fall

23 The diagram shows three properties of substances in living organisms.



Which numbered areas represent **most** enzymes?

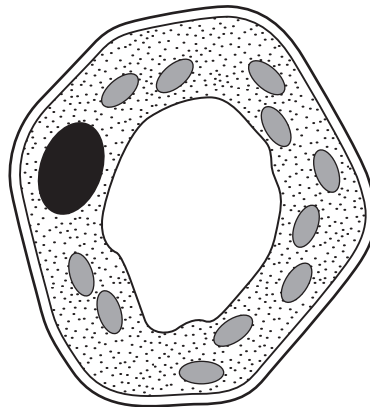
- A** 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

- 24** Some organisms live in the dark at the bottom of the seas and, to synthesise glucose, use energy from chemicals in the very hot water that comes out of volcanoes.

What is a distinguishing feature of these organisms?

- A** Their enzymes are easily denatured by heat.
- B** They do not need carbon dioxide.
- C** They do not need to be green.
- D** They obtain energy only as carnivores.

- 25** The diagram shows one type of plant cell.



What type of cell is it?

- A** epidermal cell of a leaf
 - B** mesophyll cell of a leaf
 - C** root hair cell
 - D** xylem cell
- 26** What is the function of the gall bladder?
- A** absorption of fat
 - B** digestion of fat
 - C** production of bile
 - D** storage of bile
- 27** Large, insoluble molecules have to be digested before they can be
- A** absorbed.
 - B** egested.
 - C** excreted.
 - D** ingested.

28 Which structure in a green plant transports increased quantities of water on a warm, sunny, windy day?

- A** guard cell
- B** mesophyll
- C** phloem
- D** xylem

29 What is the correct route for blood flow in a human?

- A** left atrium → left ventricle → lungs → right ventricle → right atrium
- B** left atrium → left ventricle → right ventricle → right atrium → lungs
- C** right atrium → right ventricle → left ventricle → left atrium → lungs
- D** right atrium → right ventricle → lungs → left atrium → left ventricle

30 A woman has fewer red blood cells than normal.

What would be the effect of this?

- A** Her blood contains high levels of urea.
- B** Her blood does not clot properly.
- C** Her body cells do not get enough oxygen.
- D** She cannot fight off infections.

31 What happens during vigorous exercise?

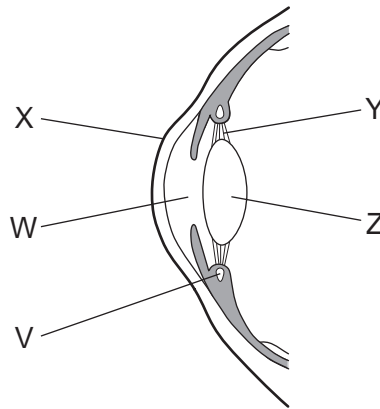
	rate of breathing	depth of each breath
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

- 32 The table shows the percentage composition of a gas in inspired and in expired air.

% composition	
inspired air	expired air
21.0	16.0

What is the gas?

- A carbon dioxide
 - B nitrogen
 - C oxygen
 - D water vapour
- 33 The diagram shows a section of a human eye focused on a near object.



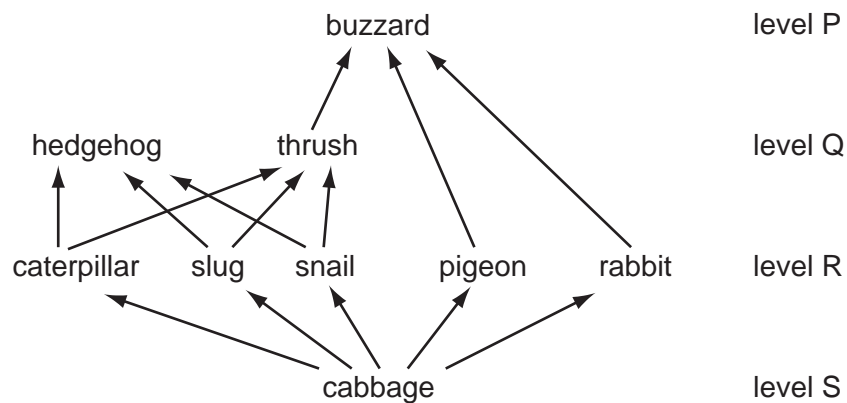
Which parts will change to focus on a distant object?

- A W, X and Y
 - B V, X and Z
 - C W, Y and Z
 - D V, Y and Z
- 34 Which organ may be damaged as it breaks down alcohol?
- A brain
 - B kidney
 - C liver
 - D stomach

35 Which is a possible sequence for energy flowing through a food web?

	lost as heat	present in glucose	present in protein	recycled for photosynthesis
A	–	2	1	3
B	1	–	3	2
C	2	3	–	1
D	3	1	2	–

36 The diagram shows a food web.



Which levels represent carnivores?

- A** P and Q **B** P and R **C** Q and R **D** R and S

37 Which effect of deforestation causes soil erosion?

- A** decreased nitrogen content
B less photosynthesis
C loss of tree roots
D reduced rainfall

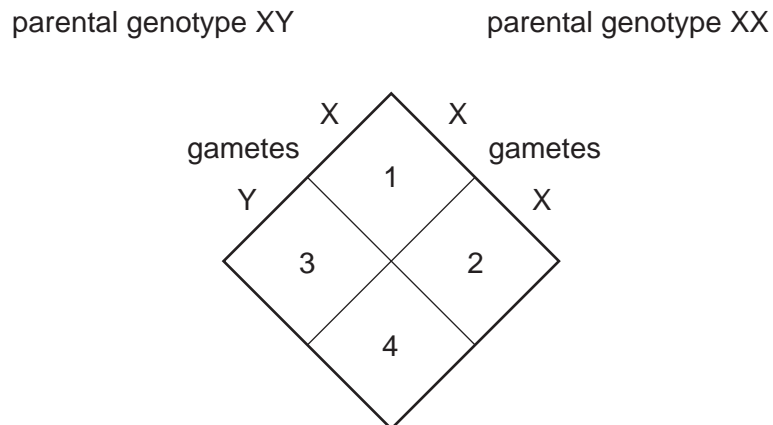
38 In addition to water, what is essential for the germination of a seed?

- A** carbon dioxide and light
B oxygen and a suitable temperature
C oxygen and soil
D soil and a suitable temperature

39 What substances are present in breast milk but not in bottled milk?

- A antibodies
- B carbohydrates
- C minerals
- D vitamins

40 The diagram shows the inheritance of sex in humans.



Which sexes are the offspring in boxes 1, 2, 3 and 4?

	1	2	3	4
A	boy	girl	boy	girl
B	boy	girl	girl	boy
C	girl	boy	girl	boy
D	girl	girl	boy	boy