

International General Certificate of Secondary Education  
UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

PHYSICS

0625/1

PAPER 1 Multiple Choice

Wednesday

13 MAY 1998

Morning

45 minutes

Additional materials:

Electronic calculator and/or Mathematical tables

Multiple Choice answer sheet

Soft clean eraser

Soft pencil (type B or HB is recommended)

TIME 45 minutes

### INSTRUCTIONS TO CANDIDATES

Do not open this booklet until you are told to do so.

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

There are forty questions in 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 very carefully the instructions on the answer sheet.

### INFORMATION FOR CANDIDATES

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

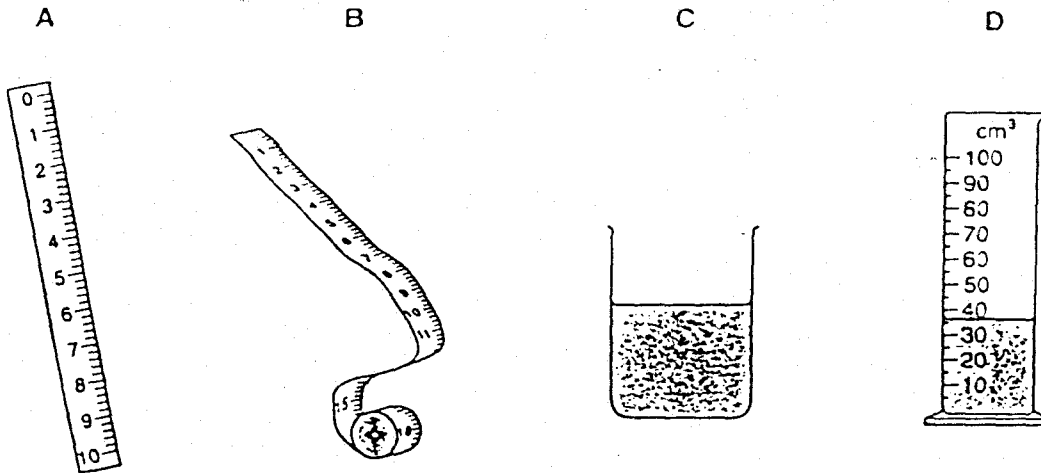
Any rough working should be done in this booklet.

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This question paper consists of 16 printed pages.

- 1 What could be used to measure the volume of a small stone?



- 2 A child is standing on the platform of a station, watching the trains.



A train travelling at  $30 \text{ m/s}$  takes 3 seconds to pass the child.

What is the length of the train?

- A 10m      B 30m      C 90m      D 300m
- 3 Four students attempt to explain what is meant by acceleration.  
Which explanation is the best?
- A the change in the speed of an object in one second  
B the distance an object travels in one second  
C the force acting on an object divided by the distance it travels in one second  
D the force acting on an object when it is near to the Earth
- 4 Which two quantities are used to find the density of a substance in the form of a cube?
- A surface area and mass  
B surface area and weight  
C volume and mass  
D volume and weight

5 A goalkeeper saves a penalty kick by punching the ball over the bar.

What happens to the ball as it is punched?

- A It changes both shape and direction.
- B It changes direction but not shape.
- C It changes neither shape nor direction.
- D It changes shape but not direction.

6 The diagram shows a man standing in a small boat.



Why is the boat less stable when the man is standing up?

- A The centre of mass of the man and boat is higher.
- B The centre of mass of the man and boat is lower.
- C The total weight becomes less.
- D The total weight becomes more.

- 7 Diagram X shows the directions of the horizontal forces acting on a van when it is moving forward at constant speed.

diagram X – constant speed

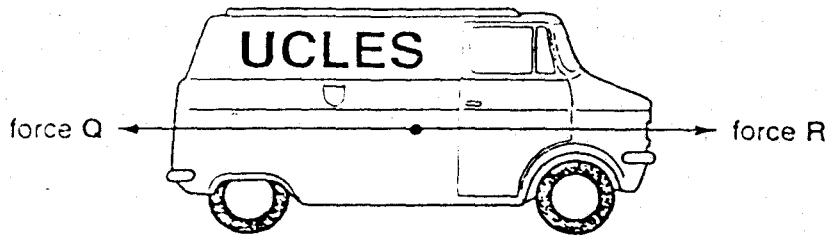
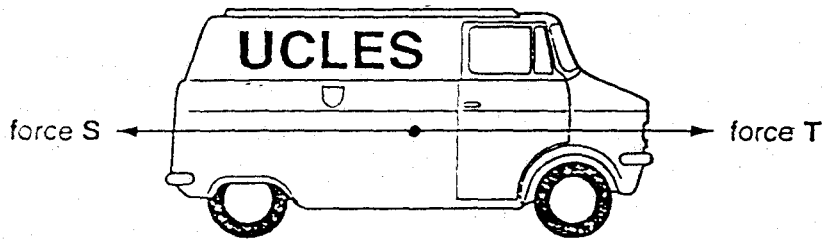


Diagram Y shows the directions of the horizontal forces acting on the same van when it is accelerating.

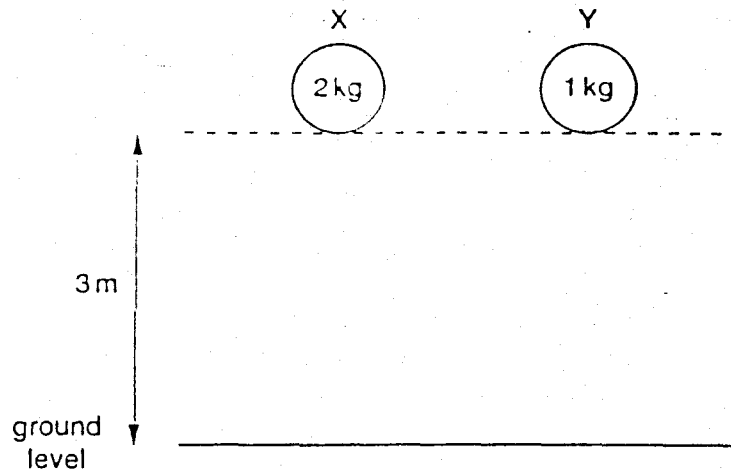
diagram Y – accelerating



Which of the following describes the sizes of the forces Q, R, S and T?

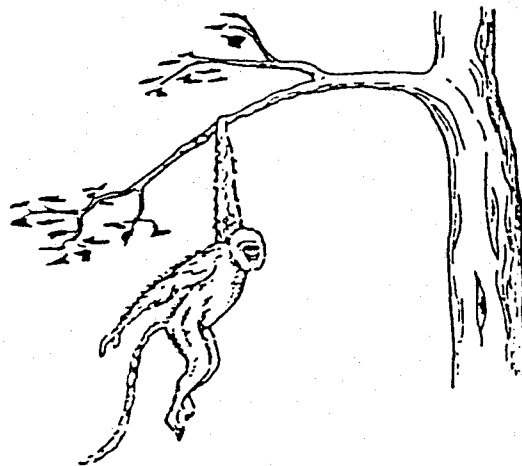
- | <i>diagram X</i><br><i>constant speed</i> | <i>diagram Y</i><br><i>accelerating</i> |
|---|---|
| A Q less than R                           | S less than T                           |
| B Q less than R                           | S equal to T                            |
| C Q equal to R                            | S less than T                           |
| D Q equal to R                            | S equal to T                            |

- 8 Two balls X and Y, one of mass 2 kg and the other of mass 1 kg, are dropped from a height of 3 m.



How do their energies of motion and their energies of position compare when they have both fallen half-way to the ground?

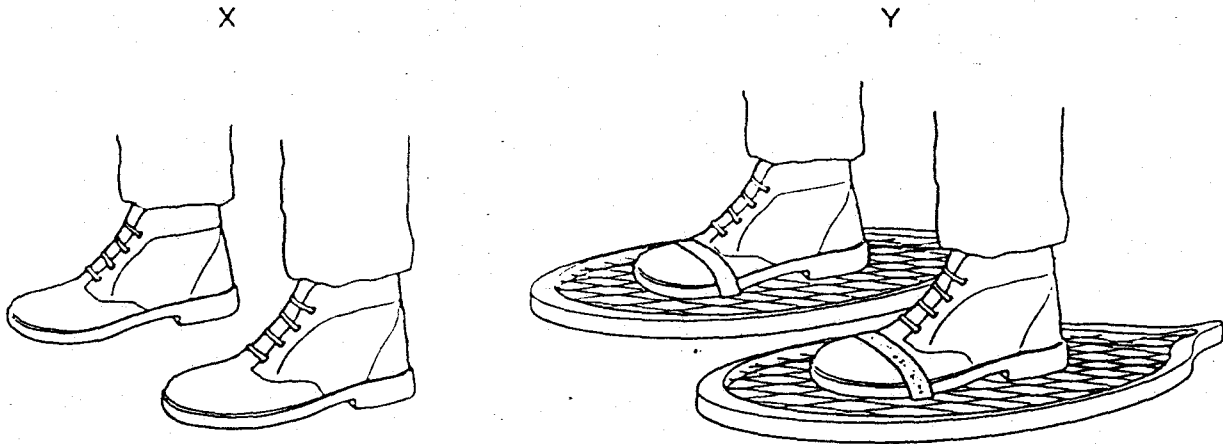
- |   | <i>energy of motion</i> | <i>energy of position</i> |
|---|-------------------------|---------------------------|
| A | X greater than Y        | X equal to Y              |
| B | X greater than Y        | X greater than Y          |
| C | Y equal to X            | Y greater than X          |
| D | Y greater than X        | Y greater than X          |
- 9 The branch of a tree bends when a monkey hangs from it.



Which type of energy is stored in the branch because of this bending?

- A chemical
- B geothermal
- C nuclear
- D strain

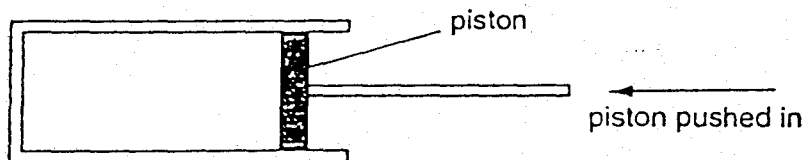
- 10 Two boys X and Y each have the same total weight and are standing on snow.



Which boy is more likely to sink in the snow and why?

	boy	pressure on snow
A	X	larger than Y
B	X	smaller than Y
C	Y	larger than X
D	Y	smaller than X

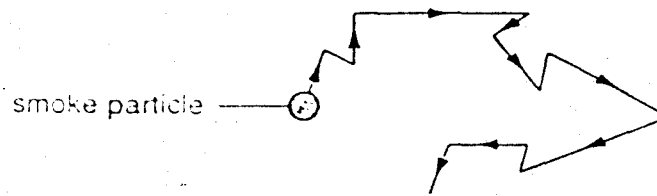
- 11 A measured mass of gas is placed in a cylinder at atmospheric pressure and is then slowly compressed.



If the temperature of the gas does not change, what happens to the pressure of the gas?

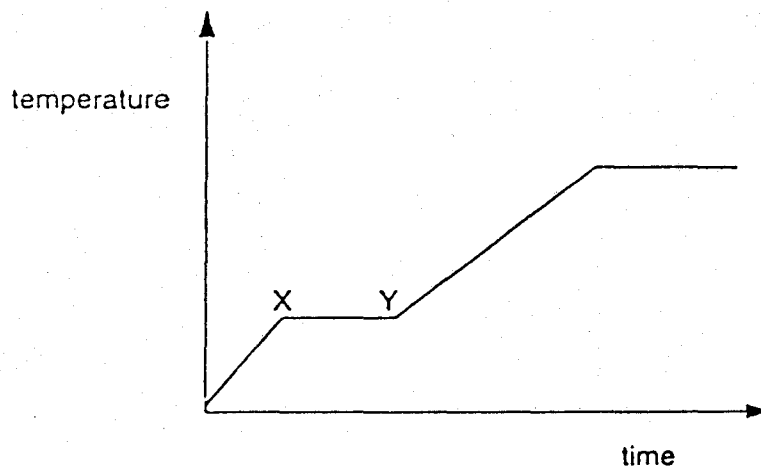
- A It drops to zero.
- B It decreases.
- C It increases.
- D It stays the same.

- 12 Smoke particles suspended in air are viewed through a microscope. The path of one smoke particle is shown.



What causes the smoke particle to follow this path?

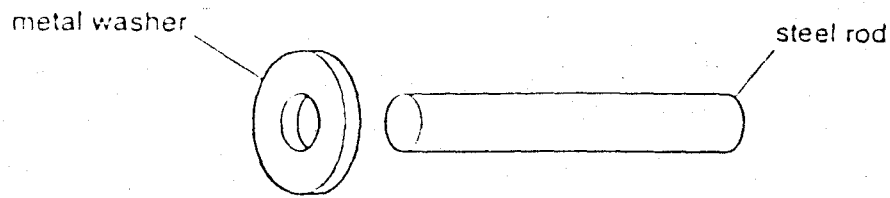
- A air molecules colliding with the smoke particle
  - B convection currents in the air
  - C small changes of pressure in the air
  - D small changes of temperature in the air
- 13 To keep a bottle of fruit-juice cool on a hot day, it may be wrapped in a cloth soaked in water.
- Why is this method successful?
- A Infra-red radiation cannot pass through the water.
  - B The evaporating water produces a cooling effect.
  - C The water has a very high thermal capacity.
  - D The water is a poor conductor of heat.
- 14 A solid substance is heated. A graph of its temperature against time is plotted.



What takes place in section XY?

- A boiling
- B condensing
- C freezing
- D melting

- 15 An engineer wants to fix a metal washer on to a steel rod. The rod is just too big to fit into the hole of the washer.

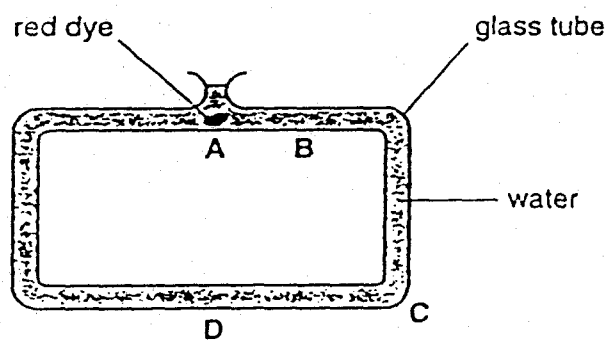


How can the engineer fit the washer on to the rod?

- A cool the washer and place it over the rod
  - B cool the washer and rod to the same temperature and push them together
  - C heat the rod and then place it in the hole
  - D heat the washer and place it over the rod
- 16 In cold countries, animals usually grow thicker layers of fur in winter to keep them warm.

Why does this extra fur keep them warm?

- A It is a good conductor of heat.
  - B It is a poor conductor of heat.
  - C It traps more air, which is a good conductor of heat.
  - D It traps more air, which is a poor conductor of heat.
- 17 The diagram shows apparatus set up to demonstrate convection currents.
- Which part of the tube should be heated to show convection currents most clearly?

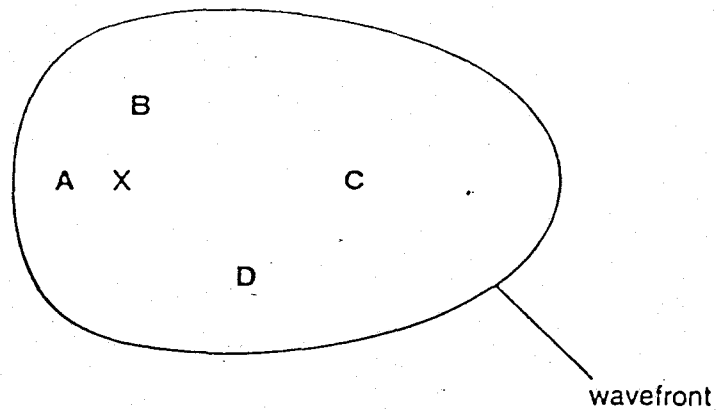




- 18 Waves travel more slowly on the surface of water when the water is shallow than when it is deep.

A person drops a stone into a pool at X. The diagram shows the first wavefront on the surface of the pool.

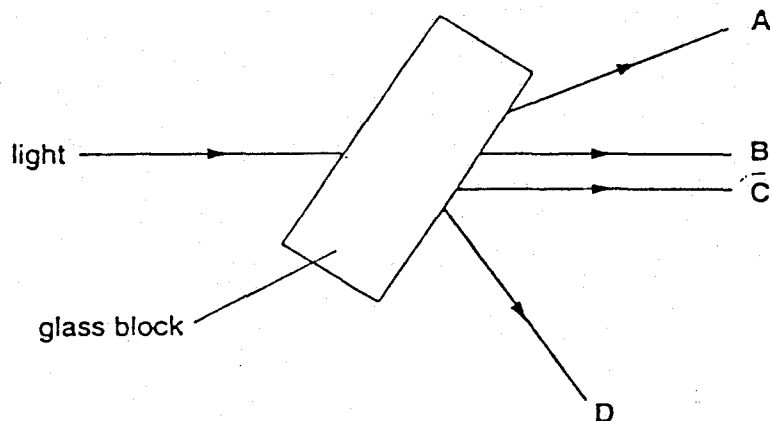
Which region of the pool is likely to be most shallow?



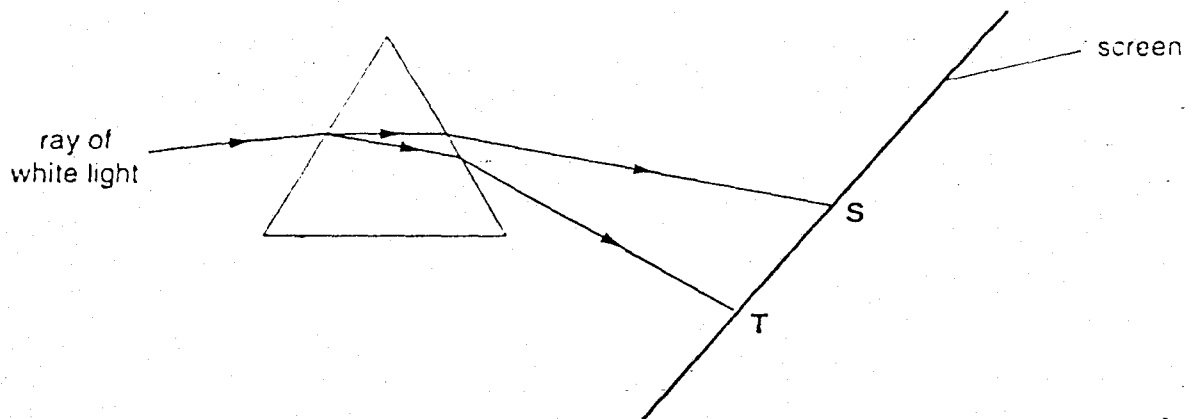
- 19 A woman tunes her radio to a station broadcasting on 200 m.

What does the 200 m tell her about the radio wave?

- A its amplitude
  - B its frequency
  - C its speed
  - D its wavelength
- 20 Which ray shows the path of the light after it has passed through the glass block?



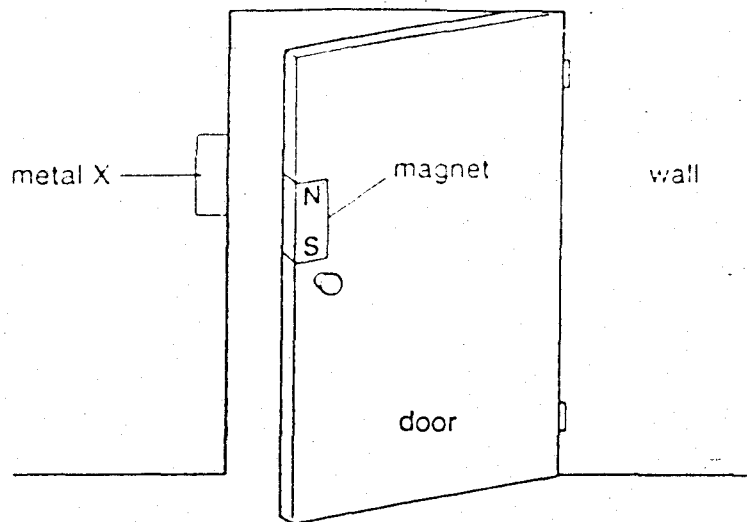
- 21 A ray of white light is shone through a prism. A spectrum ST is produced on a white screen.



What is the colour seen at T?

- A orange
  - B red
  - C violet
  - D yellow
- 22 Music is produced by the loudspeaker of a radio.
- Which property of the sound waves increases when the music is made louder?
- A amplitude
  - B frequency
  - C speed
  - D wavelength
- 23 Sound does not travel through
- A a vacuum.
  - B the air.
  - C water.
  - D wood.
- 24 Which object in a room can affect the direction of a compass needle?
- A copper cooking pan
  - B glass windows
  - C steel-framed bed
  - D wooden table

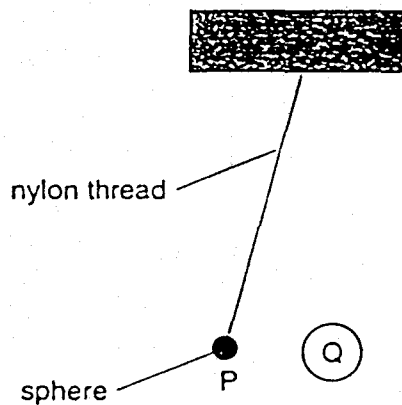
- 25 The diagram shows an arrangement for a magnetic door closer.



Which metal X is the best to use and why?

- | <i>metal</i> | <i>reason why</i>                      |
|--------------|--|
| A copper     | It is a good conductor of electricity. |
| B copper     | It is strongly attracted to a magnet.  |
| C iron       | It is a good conductor of electricity. |
| D iron       | It is strongly attracted to a magnet.  |

- 26 A metal conductor Q is brought near to a positively charged light sphere P, hanging vertically. P moves to the position shown.



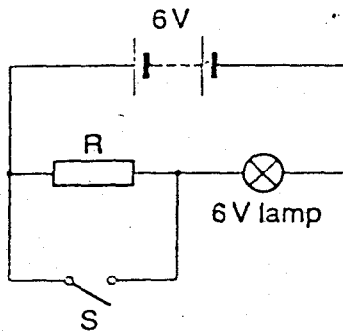
What can be said about Q?

- A It is not charged.
- B It is not possible to know its charge.
- C It is negatively charged.
- D It is positively charged.

27 Which of the following is a unit of potential difference?

- A joule
- B newton
- C volt
- D watt

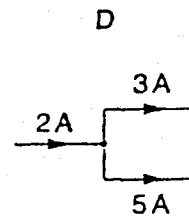
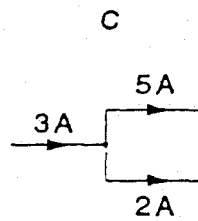
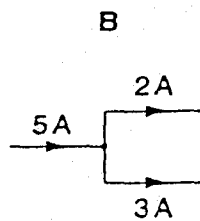
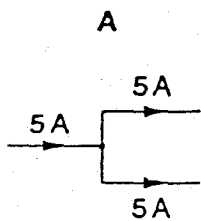
28 When the circuit shown is connected, the 6 V lamp glows.



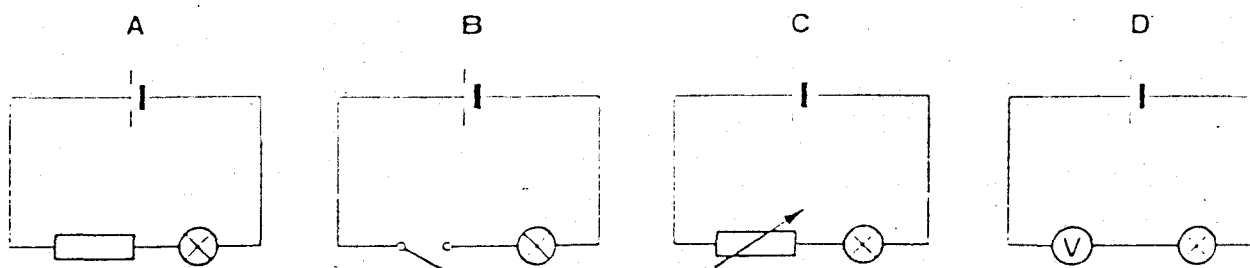
What happens to the brightness of the lamp when switch S is closed?

- A It becomes dimmer.
- B It becomes brighter.
- C It goes off.
- D It remains the same.

29 Which diagram shows possible currents at a junction in a circuit?



30 Which diagram shows a circuit that could be used to vary the brightness of a lamp?

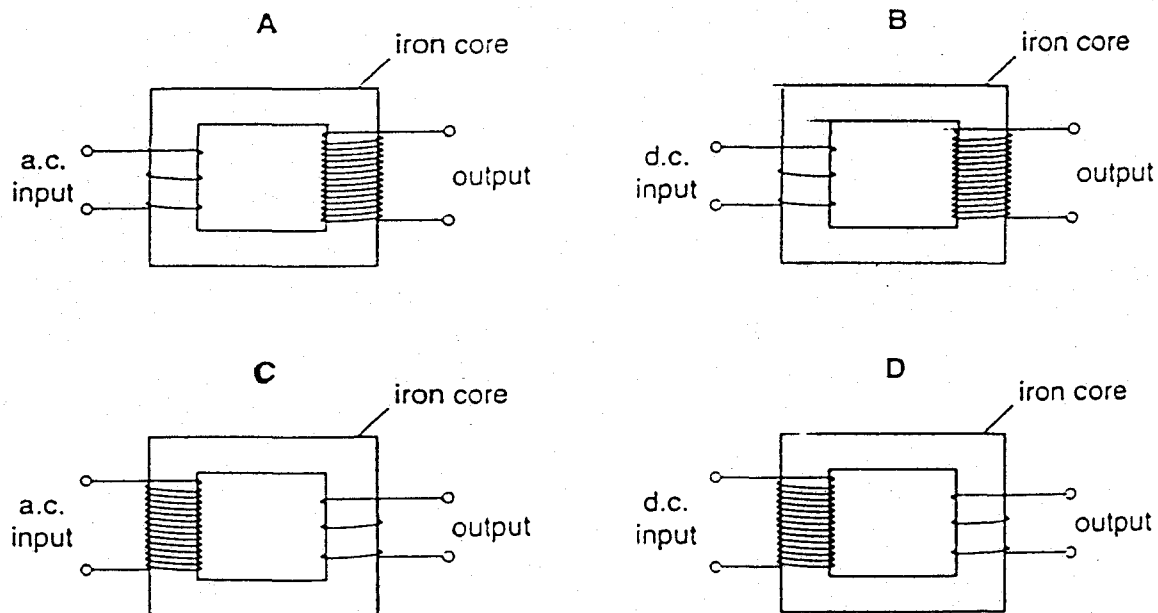


31 The instructions for a household lamp state that the plug should be fitted with a 3 A fuse.

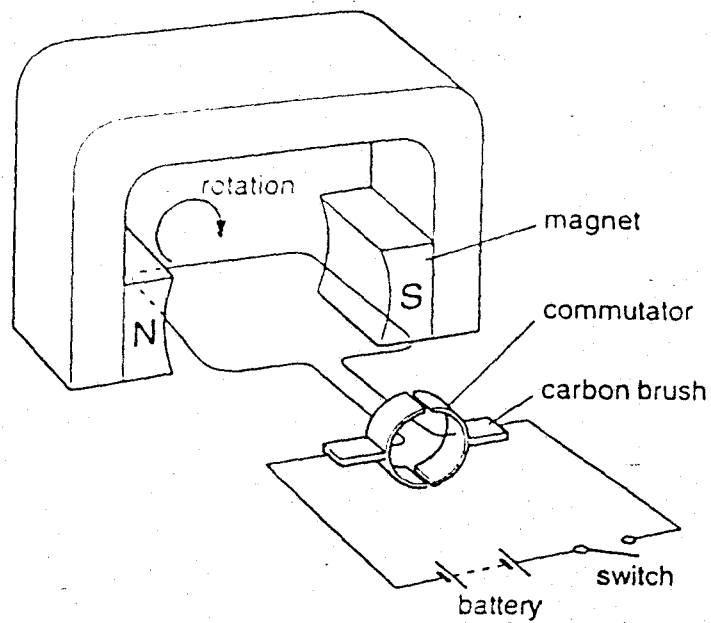
What could happen if, by mistake, a 13 A fuse is fitted?

- A The fuse might melt too easily.
- B The lamp might explode if a fault developed.
- C The wires connecting the lamp to the plug might overheat if a fault developed.
- D Too much voltage might be supplied to the lamp.

32 Which arrangement may be used to step down a voltage?



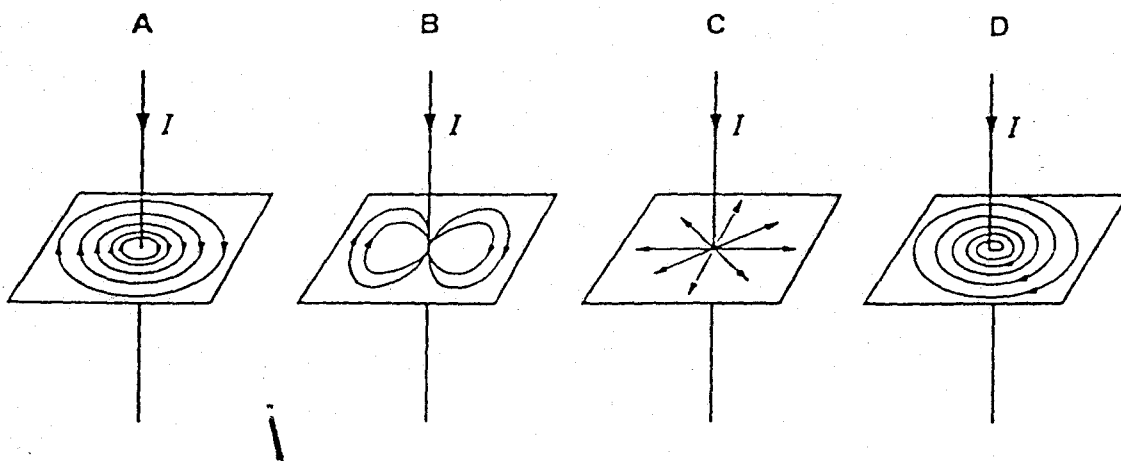
33 The diagram shows an electrical device.



What is this electrical device?

- A a.c. generator
- B d.c. motor
- C electric bell
- D transformer

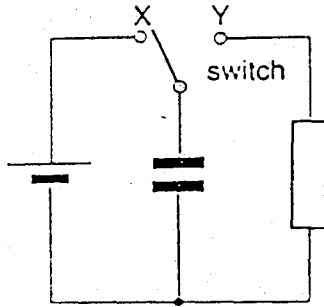
34 Which diagram shows the magnetic field pattern due to a current  $I$  in a long straight wire?



35 What is emitted from the hot part of a cathode-ray tube?

- A electrons
- B gamma-rays
- C protons
- D X-rays

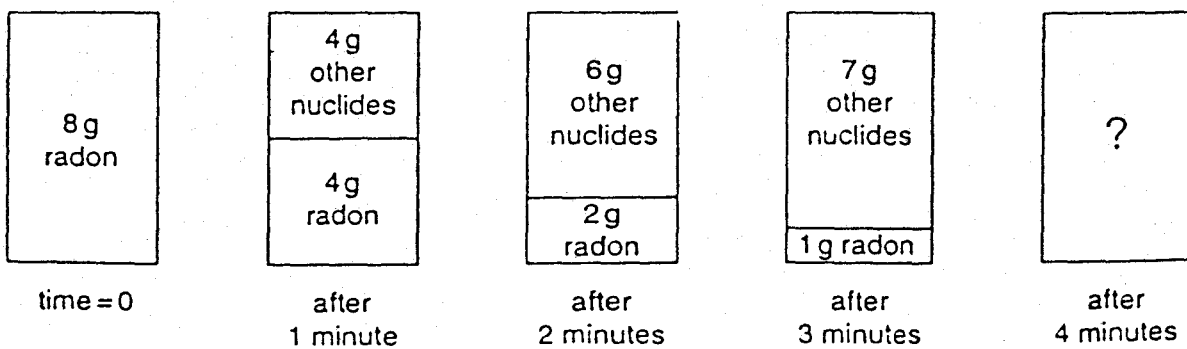
36 The diagram shows a circuit which includes a switch and a capacitor.



What happens to the capacitor when the switch is at X and when it is at Y?

- |   | <i>switch at X</i> | <i>switch at Y</i> |
|---|--------------------|--------------------|
| A | charging           | charging           |
| B | charging           | discharging        |
| C | discharging        | charging           |
| D | discharging        | discharging        |

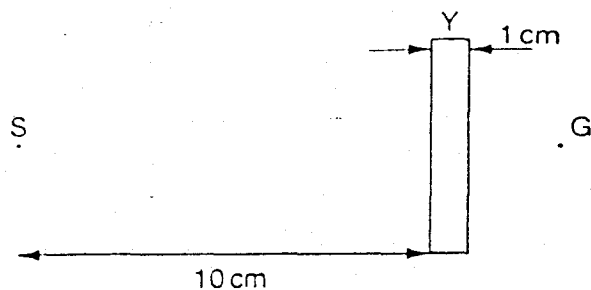
37 When an 8.0 g sample of radon decays, it turns into other nuclides, as shown.



How much radon will there be after 4 minutes?

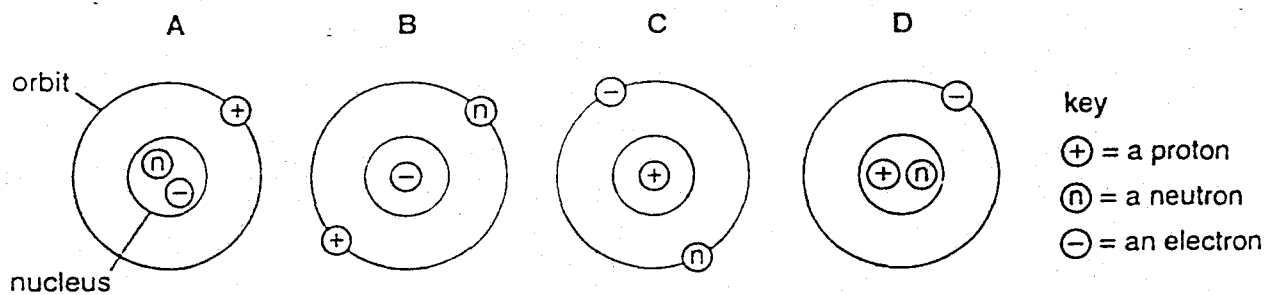
- A 0
- B 0.5g
- C 7.5g
- D 8.0g

- 38 S is a radioactive source emitting  $\alpha$ ,  $\beta$  and  $\gamma$ -radiations. Y is a sheet of aluminium 1 cm thick placed 10 cm from S.



Which radiations can be detected at G?

- A  $\alpha$  only      B  $\alpha$  and  $\beta$       C  $\gamma$  only      D  $\gamma$  and  $\beta$
- 39 Which diagram could represent an atom?



- 40 A neutral atom X has 20 electrons and 25 neutrons.

Which of the following represents a nucleus of X?

- A  ${}_{5}^{25}\text{X}$       B  ${}_{20}^{25}\text{X}$       C  ${}_{20}^{45}\text{X}$       D  ${}_{25}^{45}\text{X}$