

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

PHYSICS

0625/1

PAPER 1 Multiple Choice

Tuesday

9 NOVEMBER 1999

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.

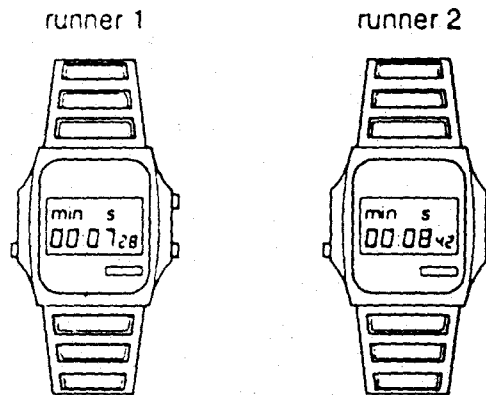
Read very carefully the instructions on the answer sheet.

INFORMATION FOR CANDIDATES

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

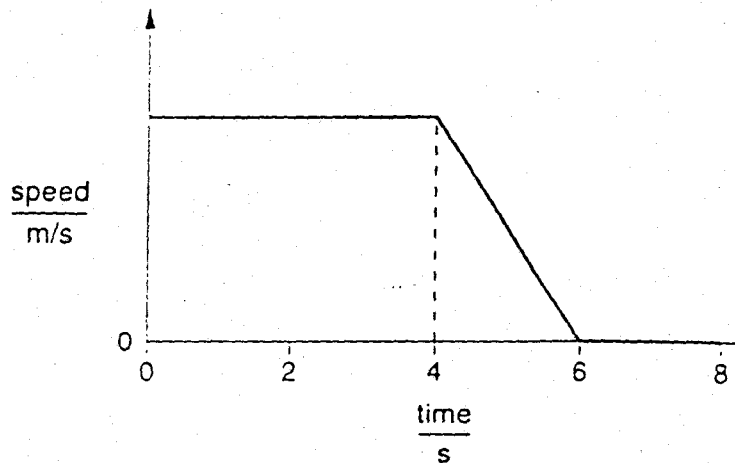
Any rough working should be done in this booklet.

- 1 The digital stopwatches show the finishing times of two runners in a race.



What is the time difference between the two runners?

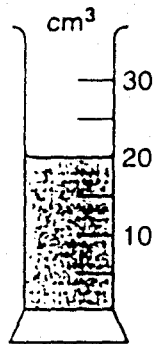
- A 1.14 s      B 7.28 s      C 8.42 s      D 15.70 s
- 2 The graph shows how the speed of an object changes with time.



For how long does the object move?

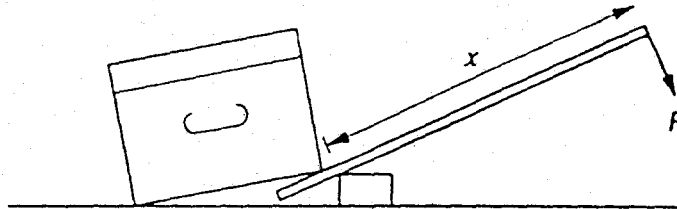
- A 2 s      B 4 s      C 6 s      D 8 s
- 3 Which statement is true about the weight of an object?
- A Its weight is the same everywhere.
- B Its weight is measured in kilograms.
- C Its weight is the force of gravity on it.
- D Its weight is zero on the Moon.

- 4 The diagram shows some liquid in a measuring cylinder. The mass of the liquid is 16 g.



What is the density of the liquid?

- A  $320 \text{ g/cm}^3$       B  $36 \text{ g/cm}^3$       C  $1.25 \text{ g/cm}^3$       D  $0.8 \text{ g/cm}^3$
- 5 A heavy box is lifted by a force  $F$ , using a lever as shown.

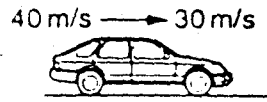


What happens when the length  $x$  is made shorter?

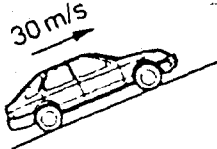
	distance $F$ moves	size of $F$
A	bigger	bigger
B	bigger	smaller
C	smaller	bigger
D	smaller	smaller

6 In which situation is there no resultant force on the car?

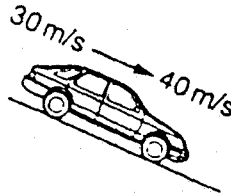
A decreasing speed on a level road



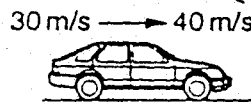
B going at a constant speed uphill



C increasing speed downhill

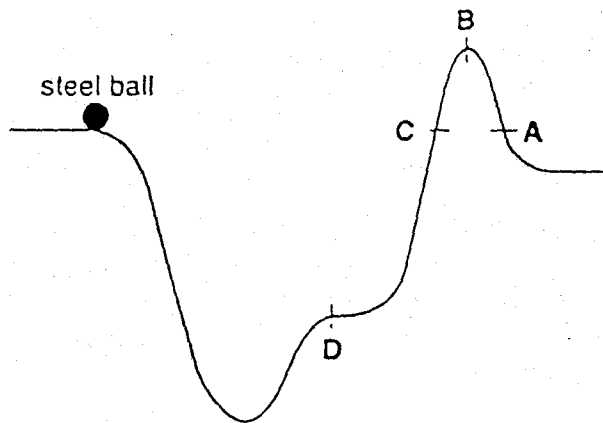


D increasing speed on a level road



7 A steel ball is allowed to roll along a frictionless track.

What is the highest point the ball reaches before rolling backwards? Ignore the effects of friction.



8 What is the source of geothermal energy?

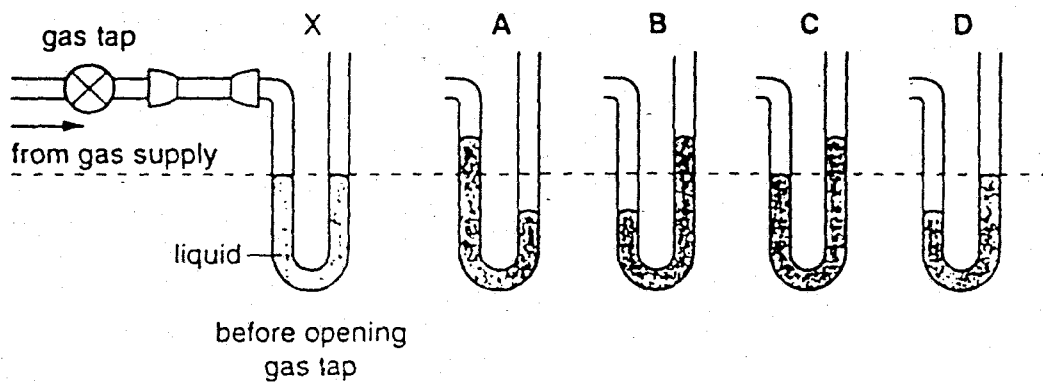
- A coal
- B hot rocks
- C tides
- D waves

9 Which object converts sound energy into electrical energy?

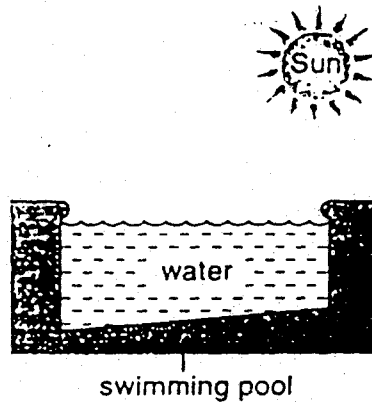
- A electric bell
- B loudspeaker
- C microphone
- D radio

10 A manometer is connected to a gas tap. Diagram X shows the liquid levels before opening the gas tap. The gas pressure is greater than atmospheric pressure.

Which diagram shows what happens to the liquid levels after opening the gas tap?



11 The diagram shows water in an outdoor swimming pool.



The water level drops during a hot, sunny day.

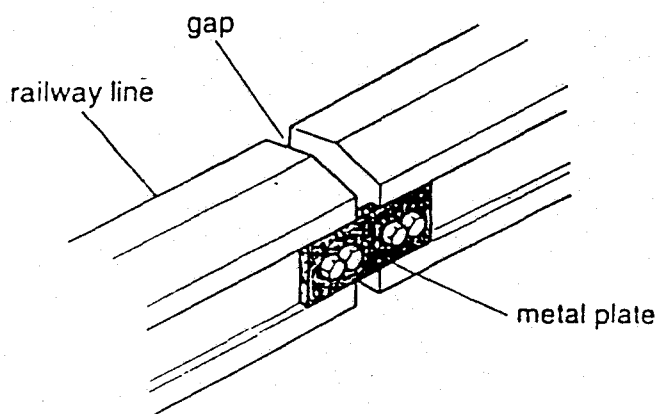
What does this show?

- A that water boils at only one temperature
- B that water can evaporate below its boiling point
- C that water can expand as it becomes warmer
- D that water is a poor conductor of heat

- 12 A closed container full of gas is left to stand on a bench for a long time.

Which statement about the molecules of the gas is correct?

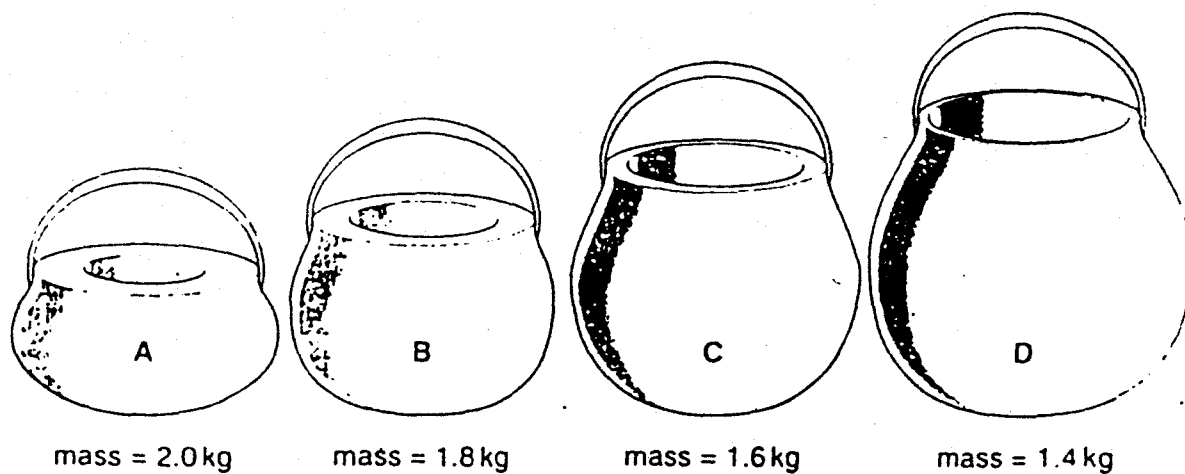
- A All the molecules are at the bottom of the container.
  - B The fastest-moving molecules are at the top of the container.
  - C The molecules are moving at random throughout the container.
  - D The pressure caused by the molecules on the container is greatest at the top of the container.
- 13 Metal railway lines can be laid in sections with small gaps in between, as shown. The sections are connected by metal plates.



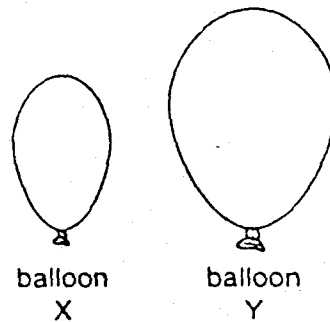
What is the reason for leaving the gaps?

- A to allow for contraction when the temperature falls
  - B to allow for expansion when the temperature rises
  - C to prevent an electric current in the railway line
  - D to stop large vibrations
- 14 Four cooking pots are each made of iron.

Which cooking pot has the greatest heat capacity?



- 15 Two balloons are inflated at the same room temperature until they have the same volume of air inside. They are then sealed. Balloon X is placed in a refrigerator for some time, while balloon Y stays at room temperature. The diagram shows the balloons after this time.

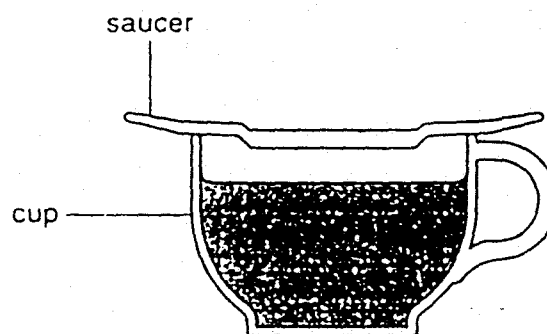


Assuming no air has leaked out of the balloons, which statement is correct?

- A The air in balloon X has contracted.
  - B The air in balloon Y has expanded.
  - C The rubber of balloon Y has expanded.
  - D The rubber of balloon X has frozen and has compressed the air.
- 16 On a day when the temperature is low, the metal handlebars of a bicycle feel colder than the plastic handlegrips.

What is the explanation for this?

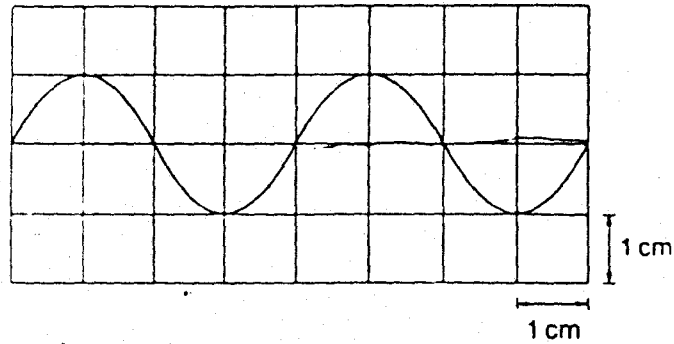
- A Metals are colder than plastics.
  - B Metals conduct heat better than plastics.
  - C Plastics are softer than metals.
  - D Plastics conduct heat better than metals.
- 17 A man puts a saucer on top of a cup of tea to keep the tea hot.



Why does this help to keep the tea hot?

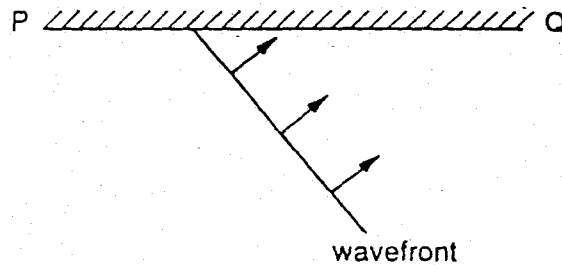
- A Conduction through the cup is reduced.
- B Convection in the air above the surface of the tea is reduced.
- C Convection in the tea is reduced.
- D Radiation from the shiny surface of the cup is reduced.

- 18 The following diagram represents a wave.



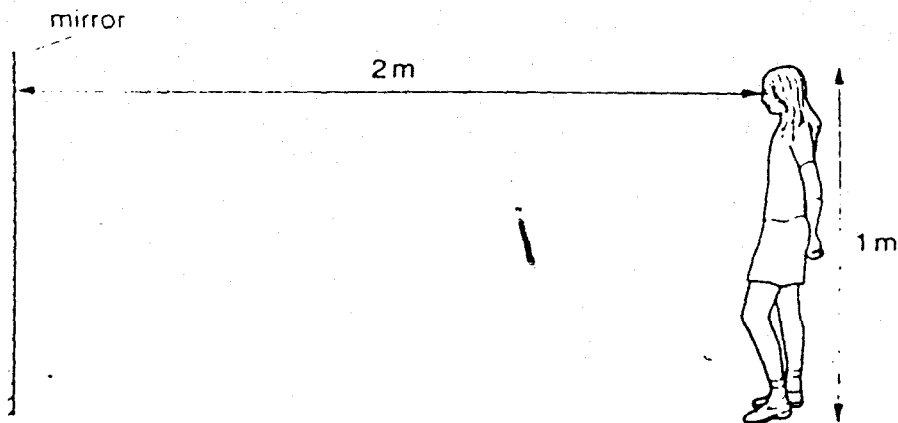
What is the wavelength of the wave?

- A 8 cm      B 4 cm      C 2 cm      D 1 cm
- 19 The diagram shows a wavefront striking a plane reflecting surface PQ.



Which of the following is changed by reflection?

- A direction  
B frequency  
C speed  
D wavelength
- 20 A child is 1 m tall. She stands 2 m in front of a plane mirror.

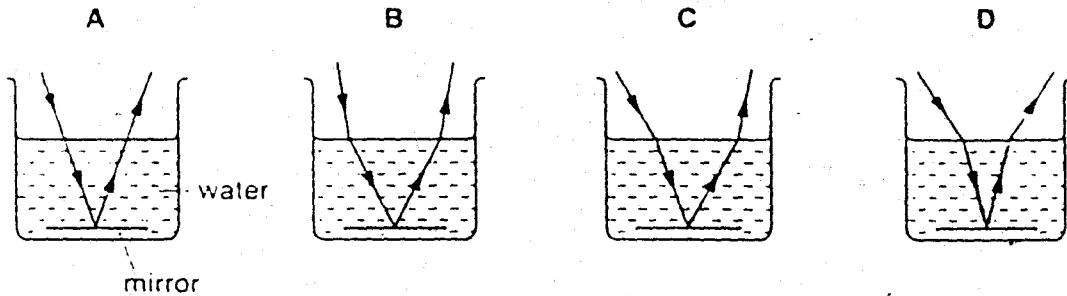


How far away from the child is her image?

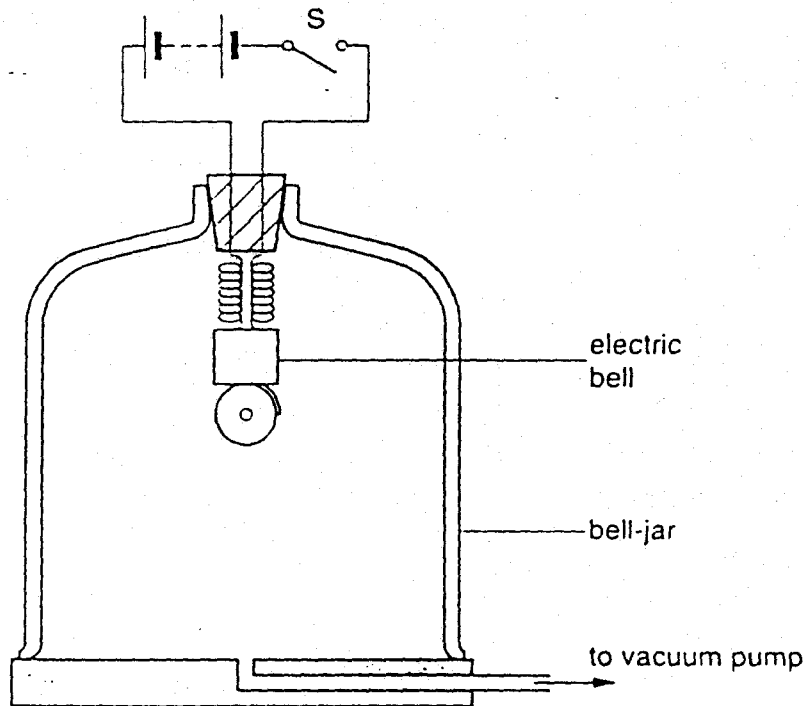
- A 1 m      B 2 m      C 3 m      D 4 m



- 21 Which diagram shows a possible path for a ray of light passing through water in a beaker with a mirror at the bottom?



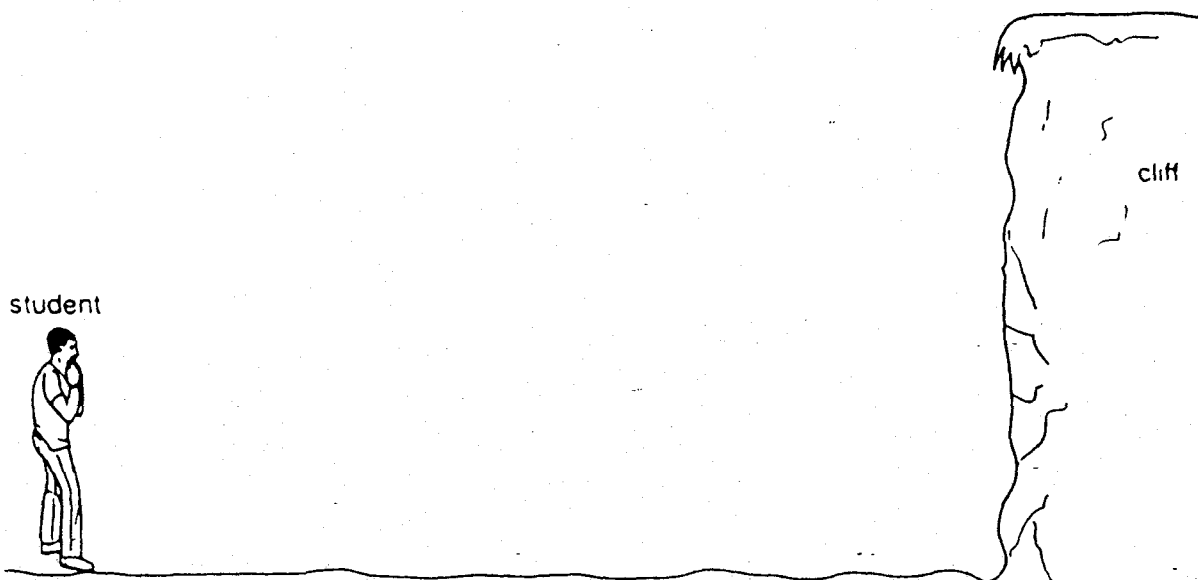
- 22 An electric bell is suspended in a bell-jar as shown. Switch S is closed and air is then pumped from the jar. The sound of the bell becomes quieter.



Why does the sound become quieter?

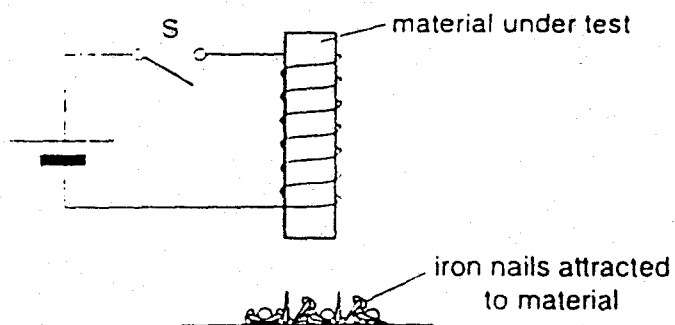
- A Air is needed for an electric current in the bell.
- B Air is needed for the bell's electromagnet to operate.
- C Air is needed for the bell to vibrate.
- D Air is needed to transmit sound waves.

- 23 A student shouts when standing by a cliff. A short time later the student hears an echo.



Which property of sound causes the echo?

- A diffraction
  - B dispersion
  - C reflection
  - D refraction
- 24 The diagram shows the circuit for an electromagnet. The core of the electromagnet can be made from different materials.

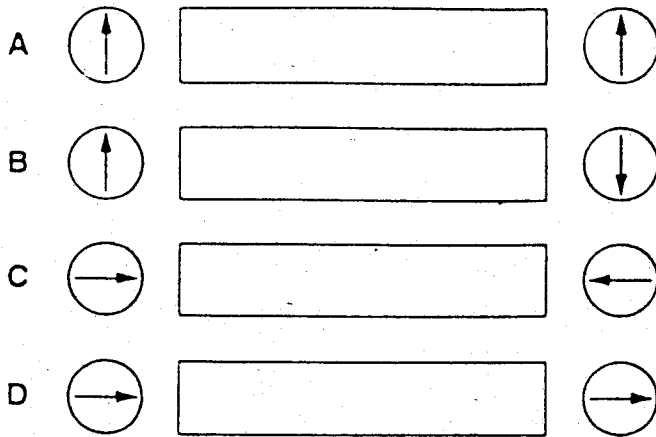


When switch S is closed, which material attracts the largest number of iron nails?

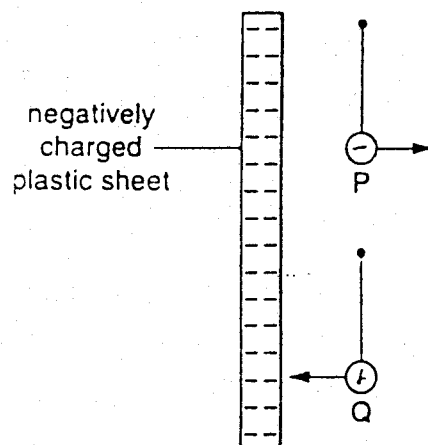
- A aluminium
- B copper
- C glass
- D iron

- 25 A plotting compass is placed at each end of a magnet.

Which diagram shows the positions of the pointers of the plotting compasses?



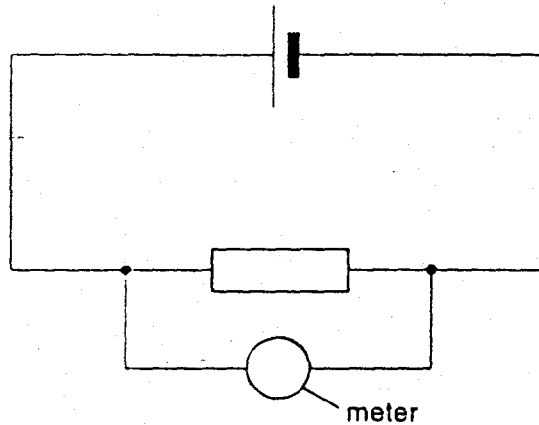
- 26 Two very light, charged balls P and Q are hung, one above the other, from nylon threads. When a negatively charged plastic sheet is placed alongside them, P is repelled and Q is attracted.



What are the original charges on P and on Q?

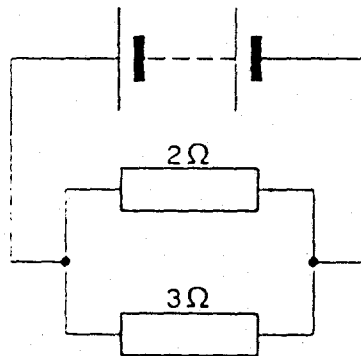
	charge on P	charge on Q
A	negative	negative
B	negative	positive
C	positive	negative
D	positive	positive

- 27 The meter in the circuit measures the potential difference across the resistor.



Which unit is marked on the scale of the meter?

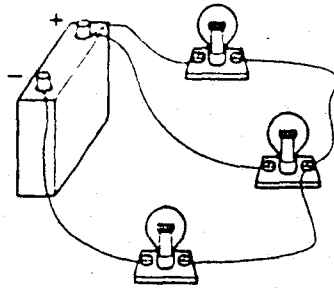
- A amp
  - B ohm
  - C volt
  - D watt
- 28 Two resistors are connected in a circuit as shown.



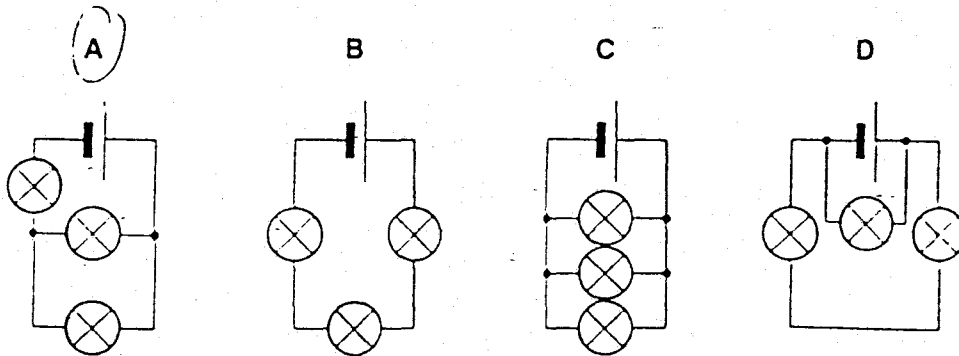
What is the total resistance of the resistors?

- A less than  $2\ \Omega$
- B between  $2\ \Omega$  and  $3\ \Omega$
- C between  $3\ \Omega$  and  $5\ \Omega$
- D more than  $5\ \Omega$

29 The diagram shows a circuit with three lamps and a cell.



What is the circuit diagram for the above arrangement?



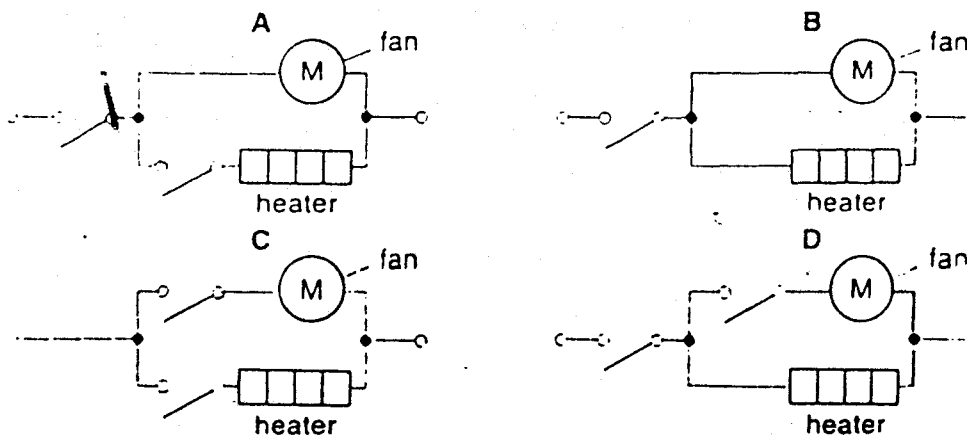
30 Which device can be used to switch off the current in a circuit when the current becomes too large?

- A capacitor
- B circuit-breaker
- C light-dependent resistor
- D transformer

31 A hair dryer should

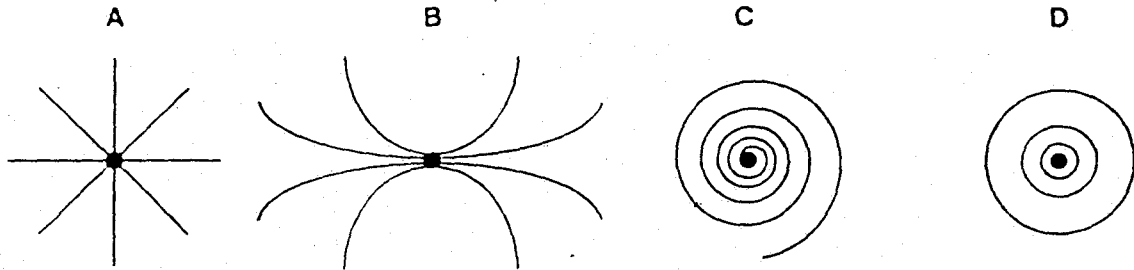
- (i) allow the fan to work with or without the heater,
- (ii) not allow the heater to work without the fan.

Which circuit should be used?



32 A straight wire carries an electric current at right angles to the page. The black dot in each diagram shows where the wire passes through the page.

Which diagram shows the magnetic field pattern around the wire?

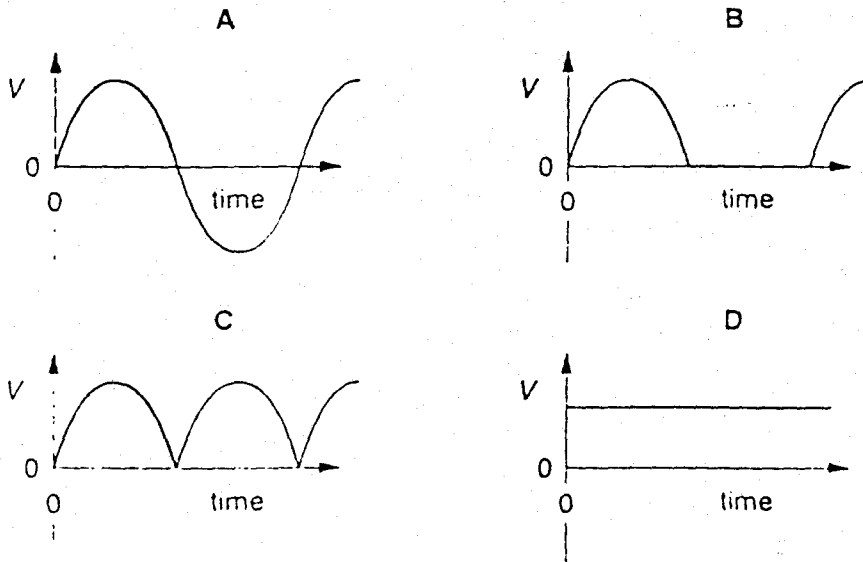


33 When electrical energy is transmitted over large distances, a high voltage is used.

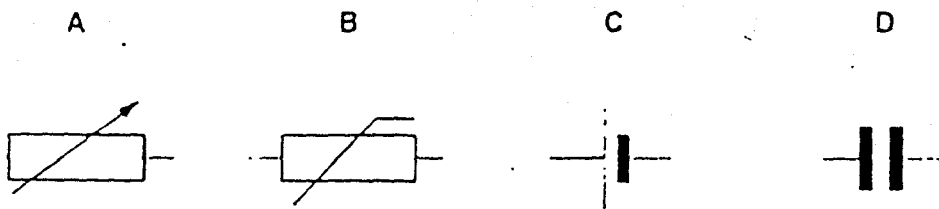
Why is this better than using a low voltage?

- A There is a greater current in the cables.
- B There is less chance of an electric shock.
- C There is less heating in the cables.
- D Thicker cables can be used.

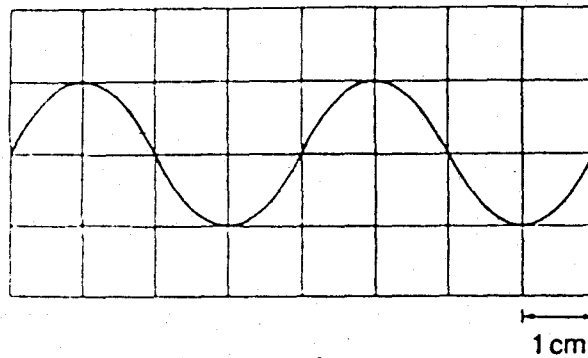
34 Which graph shows the output voltage  $V$  of an a.c. generator?



35 What is the symbol for a capacitor?

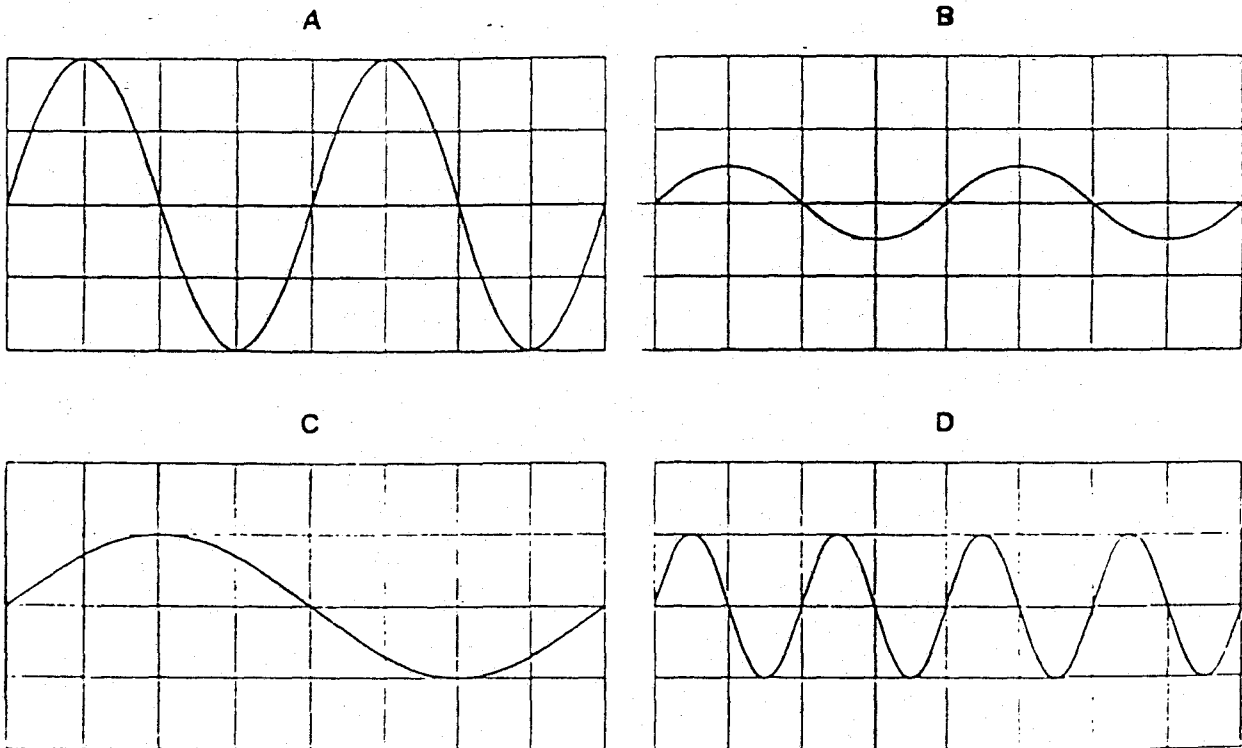


36 A waveform is displayed on the screen of a cathode-ray oscilloscope (c.r.o.).



The time base now changes from 1 ms/cm to 2 ms/cm.

Which diagram shows the new appearance of the waveform on the screen?



37 The half-life of a radioactive substance is 10 days.

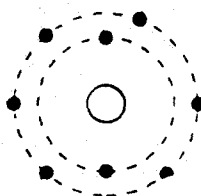
Which of the following statements is correct?

- A After 5 days, half of the original radioactive nuclei remain.
- B After 5 days, a quarter of the original radioactive nuclei remain.
- C After 10 days, half of the original radioactive nuclei remain.
- D After 20 days, none of the original radioactive nuclei remain.

38 What can most  $\alpha$ -particles pass through?

- A 2 mm of aluminium
- B 2 mm of lead
- C 2 cm of air
- D 2 cm of concrete

39 The diagram represents an atom.



Which of the following describes the atom?

	nucleus	electron	charge on electron
A	in middle of atom	orbits round nucleus	+
B	in middle of atom	orbits round nucleus	-
C	orbits round electron	in middle of atom	-
D	orbits round electron	in middle of atom	0

40 Which statement about the numbers of particles in a neutral atom must be correct?

- A number of protons = number of electrons
- B number of protons = number of neutrons
- C number of protons + number of electrons = number of neutrons
- D number of protons + number of neutrons = number of electrons