

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

**PHYSICS**

**0625/1**

**PAPER 1 Multiple Choice**

Thursday

**14 NOVEMBER 1996**

Morning

45 minutes

**Additional materials:**

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 19 printed pages and 1 blank page.

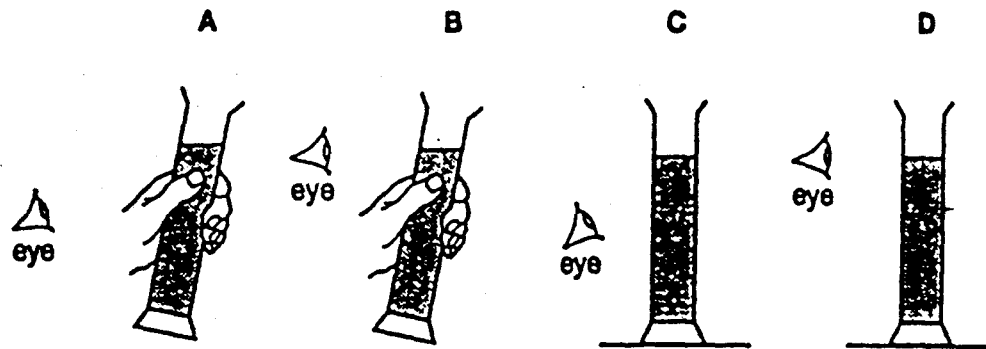
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**106**

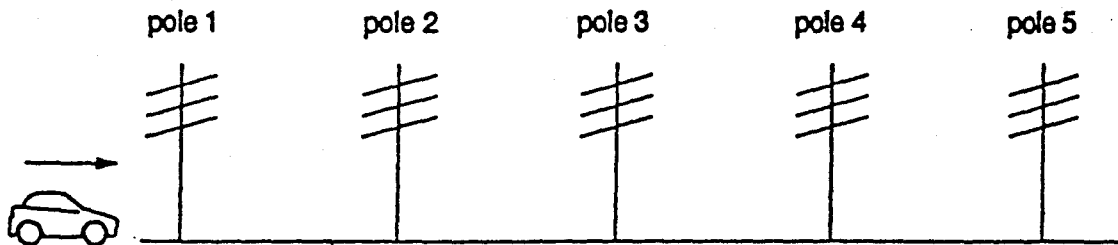
[Turn over

- 1 A student wishes to measure the volume of a liquid, using a measuring cylinder.

Which diagram shows how this can be done most accurately?



- 2 Five telegraph poles are positioned at equal distances along the side of a road.



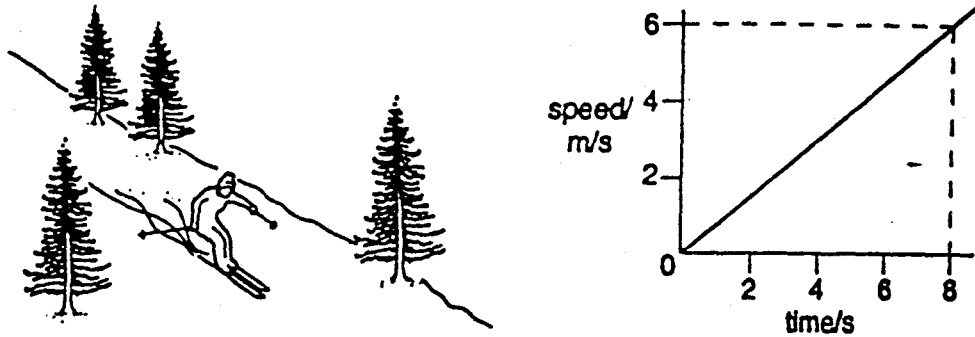
A car accelerates until it is level with pole 4. The car then continues along the road at a steady speed. The times to travel between one pole and the next are measured.

Which time is the greatest?

The time between

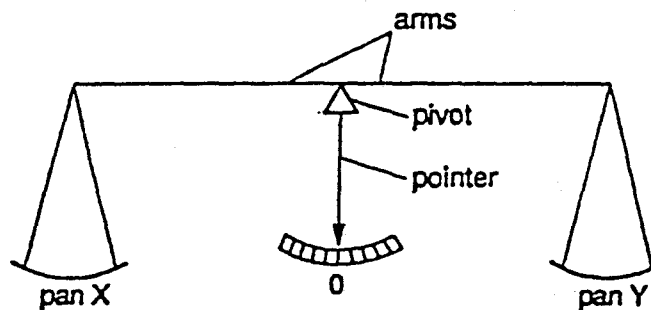
- A pole 1 and pole 2.
- B pole 2 and pole 3.
- C pole 3 and pole 4.
- D pole 4 and pole 5.

- 3 A skier has just started to ski down a snow-covered mountain. The speed-time graph for the first part of his journey is shown.



How far does the skier travel in the first 8 s?

- A 6 m      B 8 m      C 24 m      D 48 m
- 4 A simple balance has two pans suspended from the ends of arms of equal length. When it is balanced, the pointer is at 0.

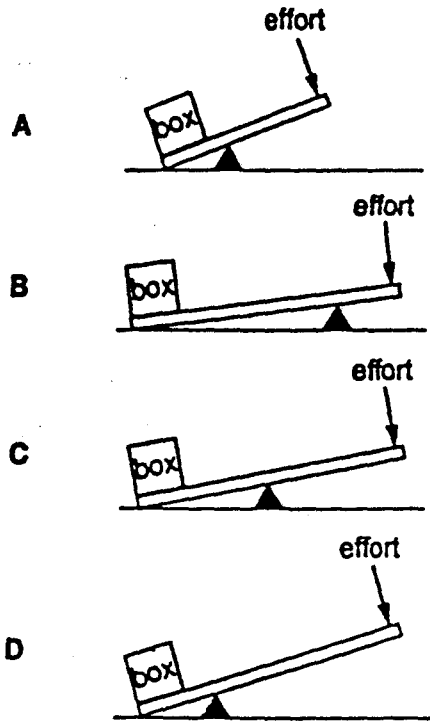


Four masses (in total) are placed on the pans, with one or more on pan X, and the rest on pan Y.

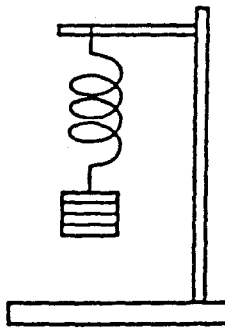
Which combination of masses can be used to balance the pans?

- A 1g, 1g, 5g, 10g  
 B 1g, 2g, 2g, 5g  
 C 2g, 5g, 5g, 10g  
 D 2g, 5g, 10g, 10g

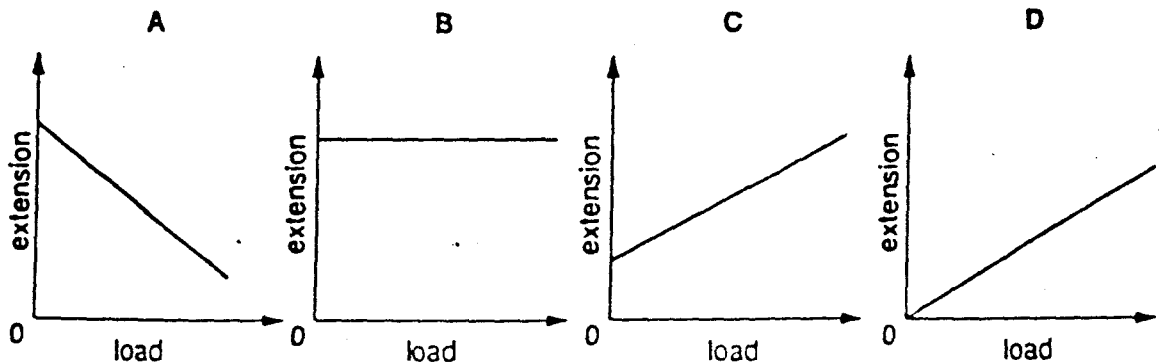
- 5 The diagrams show four methods of lifting a heavy box by using a lever.  
Which method requires the smallest effort to lift the box?



- 6 A spring is suspended from a stand. Loads are added and the extensions are measured.



Which graph shows the result of plotting extension against load?



- 7 In a car engine, energy stored in the fuel is converted into heat energy and mechanical energy.

In which form is the energy stored in the fuel?

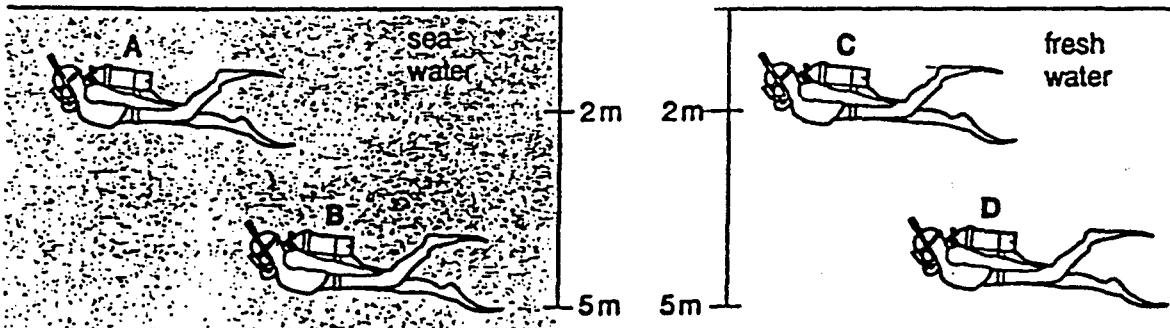
- A chemical
- B geothermal
- C hydroelectric
- D nuclear

- 8 Which of the following is a unit of work?

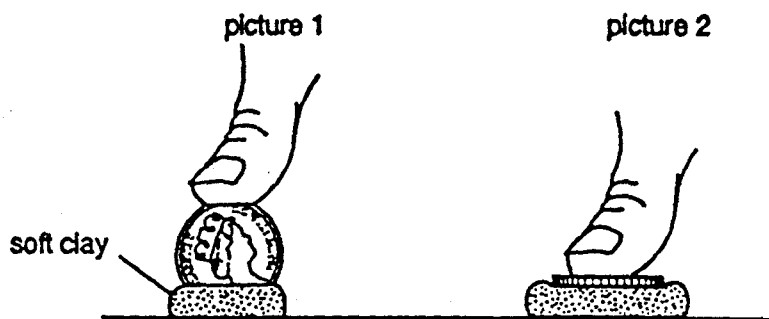
- A ampere
- B joule
- C volt
- D watt

- 9 The diagrams show two divers swimming in the sea and two divers swimming in fresh water. Sea water is more dense than fresh water.

On which diver is there the greatest pressure?



- 10 A coin is pushed into some soft clay as shown.



Why does the coin in picture 1 sink more easily into the soft clay?

- A There is a greater pressure because of a greater area in contact.
  - B There is a greater pressure because of a smaller area in contact.
  - C There is a smaller pressure because of a greater area in contact.
  - D There is a smaller pressure because of a smaller area in contact.
- 11 The table lists the melting points and boiling points of four different substances.

Which substance is a gas at 25 °C?

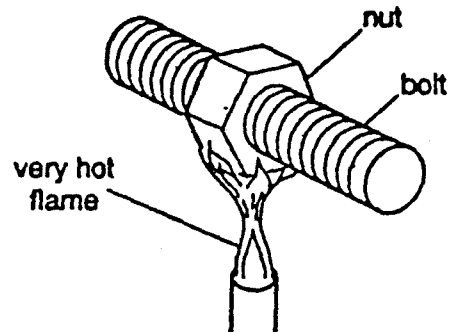
	<i>melting point</i> °C	<i>boiling point</i> °C
A	-219	-183
B	-7	58
C	98	890
D	1083	2582

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

Which statement about the molecules 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.

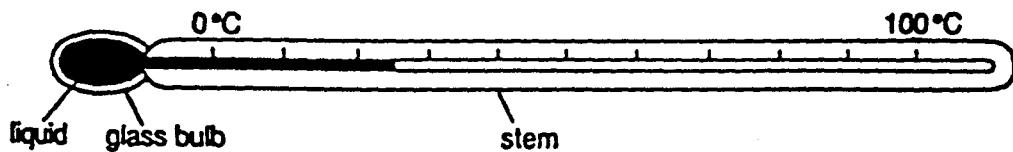
- 13 The nut on a bolt will not turn. It can be released by heating the nut for a short time with a very hot flame.



How can this be explained?

- A The hole in the nut expands more than the bolt.
  - B The bolt expands more than the hole in the nut.
  - C The nut and the bolt both expand equally.
  - D The heat from the flame is conducted to the bolt.
- 14 A pan of water is put on an electric heater.
- What happens when the water is boiling?
- A The heat stops going into the water.
  - B The heat goes into the water more quickly than before.
  - C The temperature of the water rises more slowly than before.
  - D The temperature of the water stops rising.

- 15 The diagram shows a liquid-in-glass thermometer.



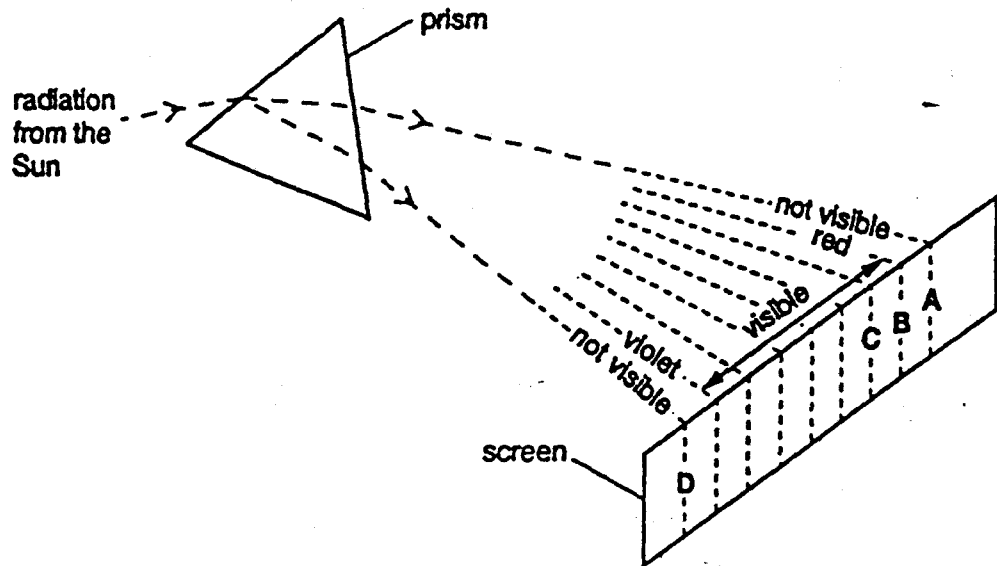
When the thermometer becomes hotter, the liquid moves further along the stem.

Why is this?

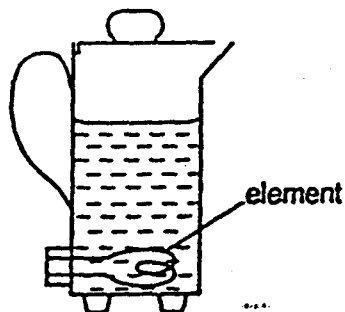
- A The glass contracts.
- B The glass expands.
- C The liquid contracts.
- D The liquid expands.

- 16 Some of the Sun's radiation passes through a prism. The diagram shows the spectrum of this radiation.

Which point on the screen does the Infra-red radiation reach?



- 17 An electric kettle is made of a plastic material.

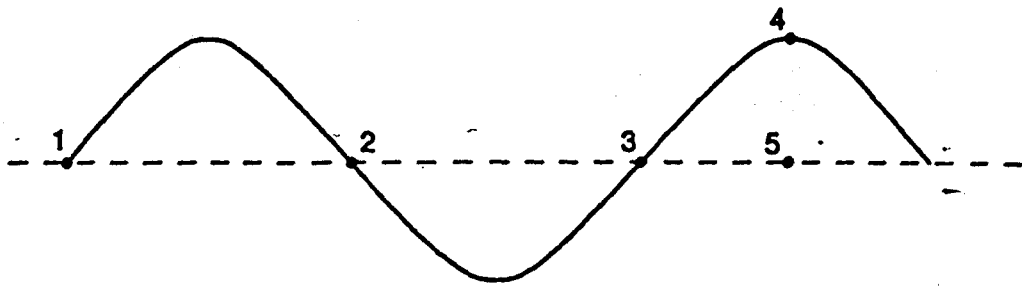


Why is the heating element placed near the base of the kettle?

- A Heat rises.
- B Hot water rises.
- C The kettle is a good conductor of heat.
- D Water is a good conductor of heat.

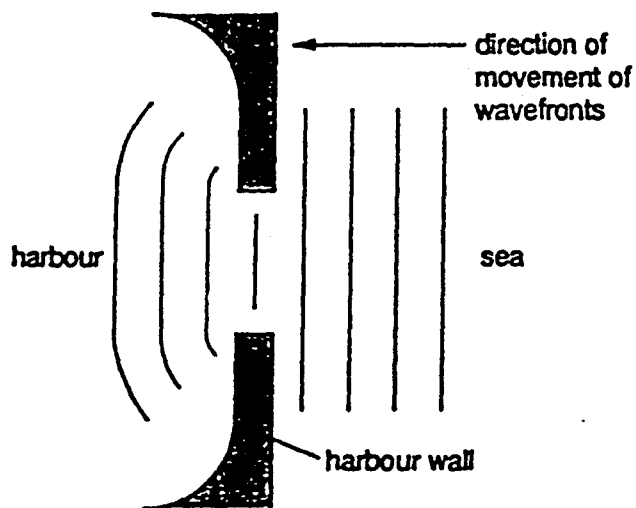


- 18 The diagram shows a transverse wave.



Which distance is equal to one wavelength?

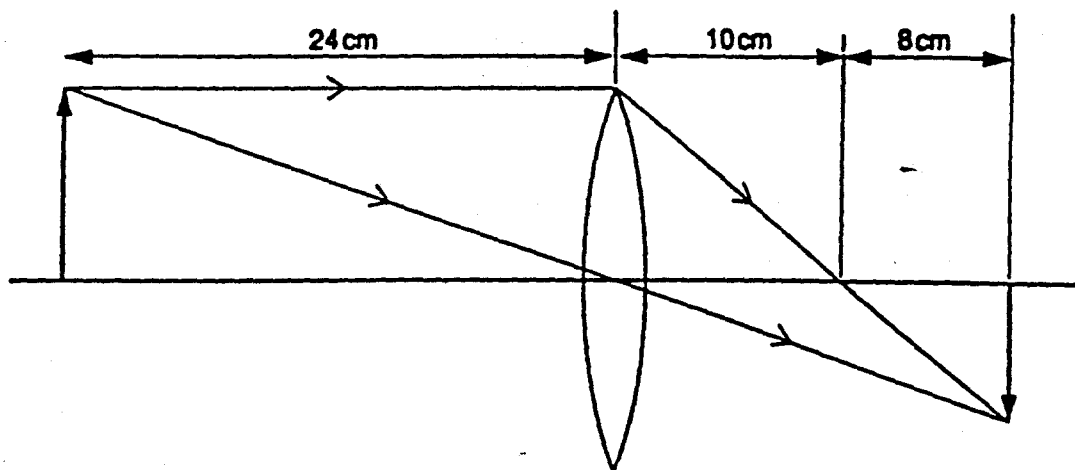
- A The distance between points 1 and 2.
  - B The distance between points 1 and 3.
  - C The distance between points 2 and 3.
  - D The distance between points 4 and 5.
- 19 The diagram shows what happens to wavefronts at sea when they enter a harbour.



What causes the change in the shape of the wavefronts?

- A diffraction
- B dispersion
- C reflection
- D refraction

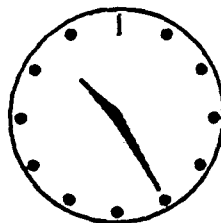
20 The ray diagram shows how an image is formed by a converging lens.



What is the focal length of this lens?

- A 8 cm      B 10 cm      C 18 cm      D 24 cm

21 The image of a clock face as seen in a plane mirror is shown.



What time does the clock face show?

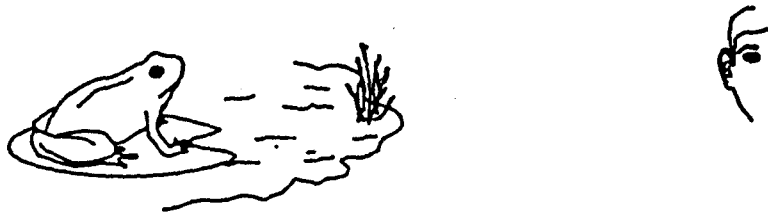
- A 1.25      B 1.35      C 10.25      D 10.35

22 A violin is producing a note of frequency 256 Hz.

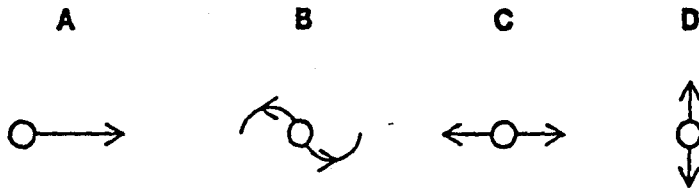
This means that the violin string

- A is 256 cm long.  
 B has a wavelength of 256 m.  
 C sends out waves travelling at 256 m/s.  
 D vibrates 256 times each second.

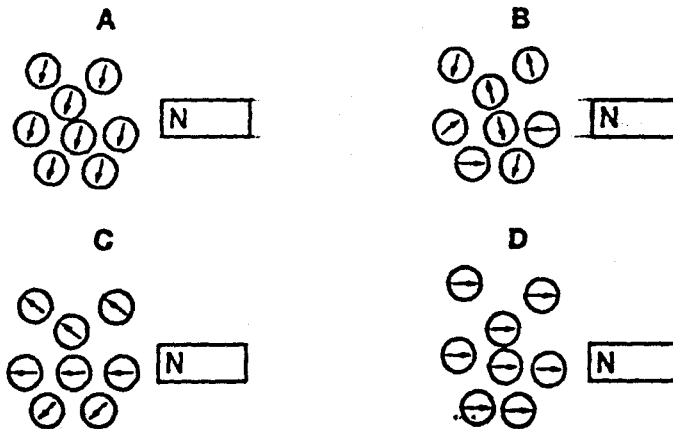
23 Sound energy is transmitted from a croaking frog to a listener's ear by vibrating molecules of air.



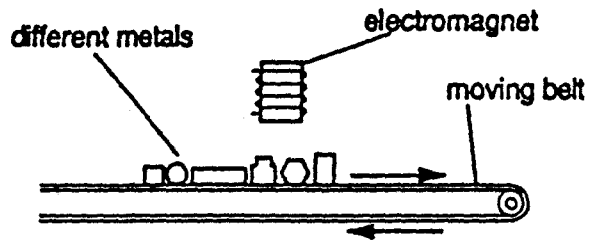
Which diagram represents the motion of any air molecule between the frog and the listener?



24 Which diagram shows the position of the pointers of some small compasses placed near to the north pole of a bar magnet?



- 25 Different metals are separated by passing them under an electromagnet, which attracts and lifts out some of the metals.



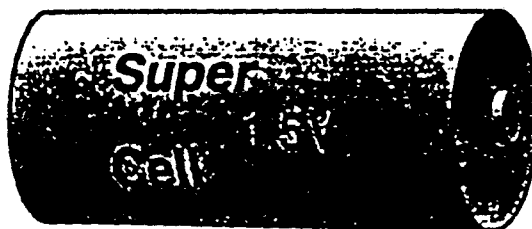
Which line in the table correctly shows what happens to the metals?

- |   | <i>attracted</i> | <i>not attracted</i> |
|---|------------------|----------------------|
| A | copper           | aluminium            |
| B | copper           | steel                |
| C | iron             | aluminium            |
| D | iron             | steel                |
- 26 When a plastic rod is rubbed with a dry cloth, the rod gains electrons from the cloth.

What is the sign of the charge on the rod and on the cloth, and the nature of the force between them?

- |   | <i>sign of charge on the rod</i> | <i>sign of charge on the cloth</i> | <i>nature of force exerted between them</i> |
|---|----------------------------------|------------------------------------|---|
| A | positive                         | positive                           | repulsive                                   |
| B | negative                         | positive                           | attractive                                  |
| C | positive                         | negative                           | repulsive                                   |
| D | negative                         | negative                           | attractive                                  |

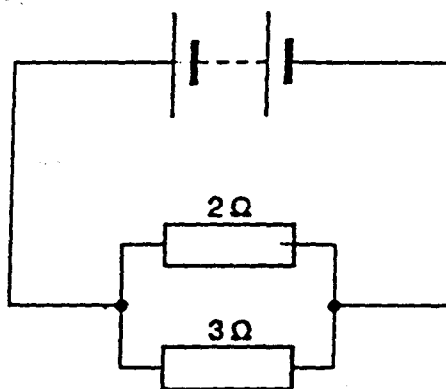
27 A cell has '1.5V' marked on it.



What does this mean?

- A The current the cell can supply is 1.5V.
- B The e.m.f. of the cell is 1.5V.
- C The energy stored in the cell is 1.5V.
- D The power the cell can supply is 1.5V.

28 Two resistors are connected in a circuit as shown.

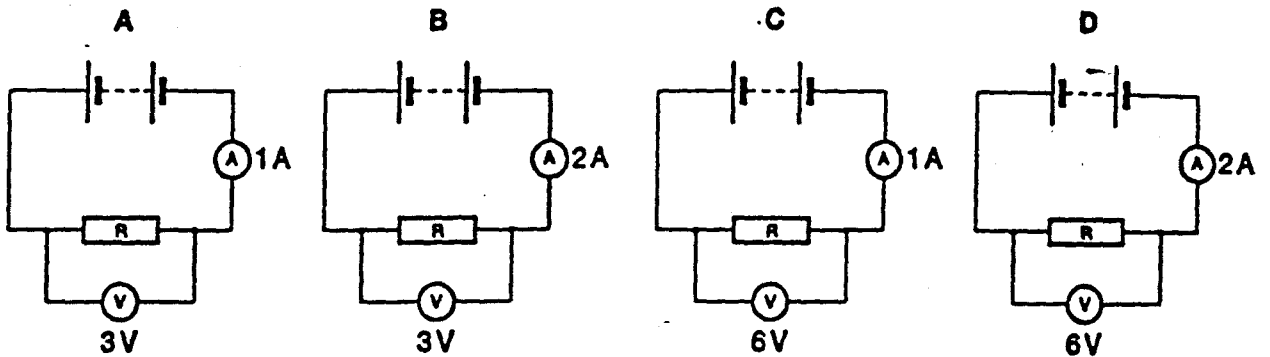


What is the total resistance of the resistors?

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

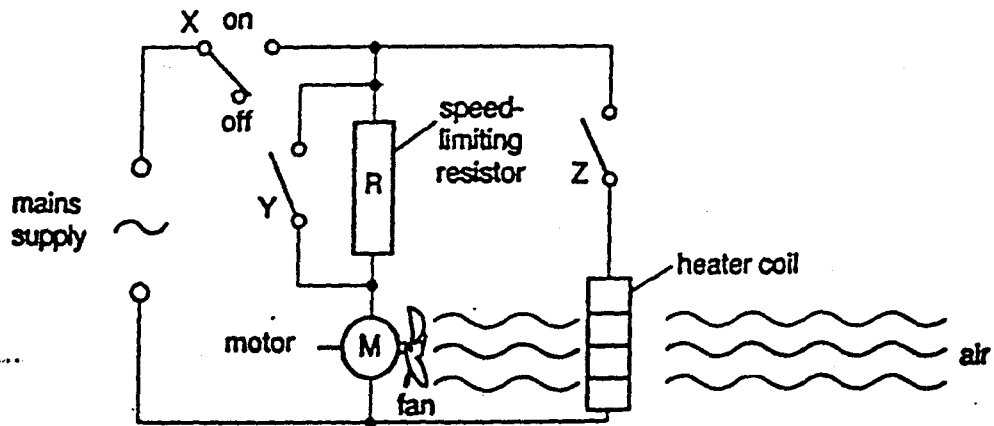
29 The values of the readings on the ammeter and voltmeter are shown beside their symbols in the diagrams.

In which circuit does the resistor R have the smallest resistance?



30 The circuit diagram for a fan heater is shown. The motor can run at high or low speed, and the fan heater can blow hot or cold air.

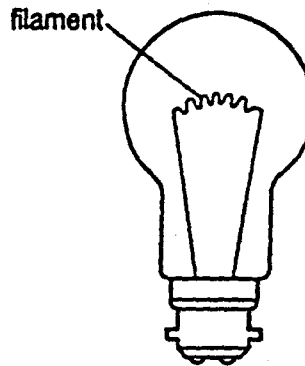
The motor driving the fan runs at low speed when resistor R is connected in series with the motor.



Which switches should be closed so that the motor runs at high speed and the heater blows hot air?

- A X only
- B X and Y
- C X and Z
- D X, Y and Z

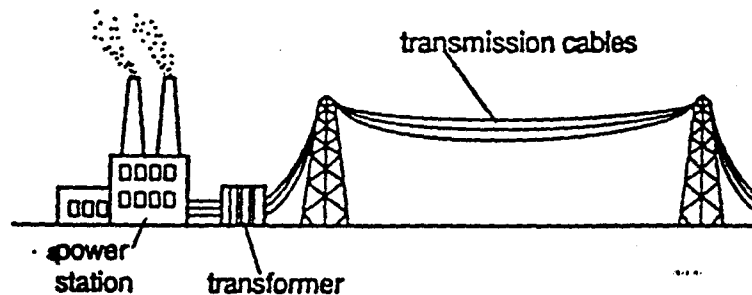
31 The diagram shows an electric light bulb.



What are the main types of wave given out by the filament?

- A visible light and infra-red
- B visible light and radio
- C visible light and sound
- D visible light and ultraviolet

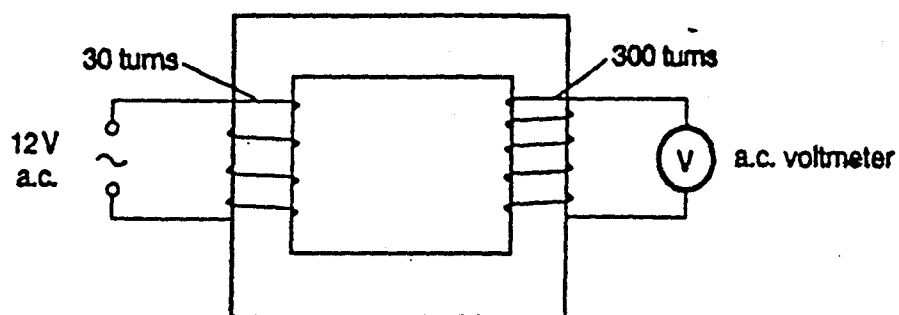
32 A transformer links a power station to transmission cables.



What is this transformer designed to do?

- A to increase the power delivered to the transmission cables
- B to decrease the power delivered to the transmission cables
- C to increase the voltage delivered to the transmission cables
- D to decrease the voltage delivered to the transmission cables

33 The diagram shows a transformer.



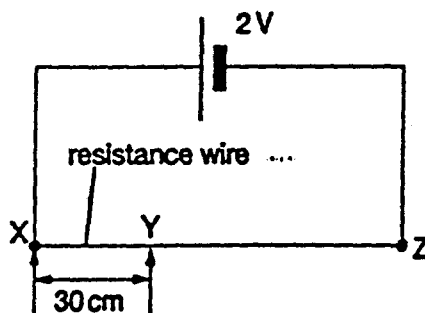
What is the voltmeter reading?

- A 1.2V    B 12V    C 120V    D 1200V

34 Which device makes use of the magnetic effect of an electric current?

- A an electric bell  
 B an electric fire  
 C a fuse wire  
 D a light bulb

35 A resistance wire XZ, of length 100 cm, is connected in series with a 2V cell.

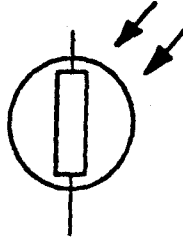


What is the potential difference across XY?

- A 0.3V    B 0.6V    C 2.0V    D 3.3V



36 A circuit contains the component shown by the following symbol.

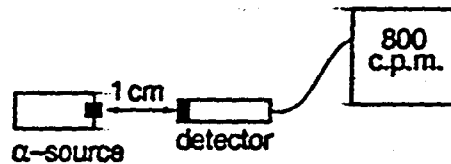


Which change would the component detect?

A change in

- A light level.
- B potential difference.
- C radioactivity.
- D temperature.

37 A source of  $\alpha$ -particles is placed 1 cm away from a detector. The detector gives a reading of 800 counts per minute (c.p.m.).

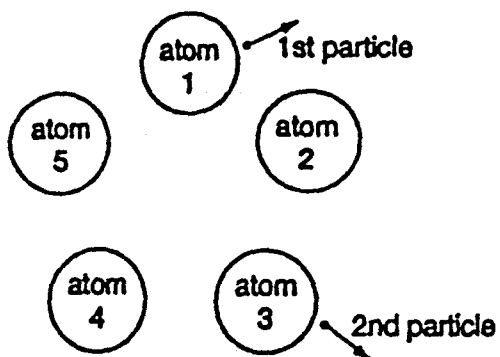


The source is then moved 100 cm away from the detector.

What happens to the reading? ....

- A It becomes 0.
- B It becomes 8 counts per minute.
- C It records only the background radiation rate.
- D It stays the same.

38 The diagram shows five atoms in a radioactive substance. The atoms give out  $\alpha$ -particles.



Atom 1 is the first to give out a particle. Atom 3 is the second to give out a particle.

Which atom will give out the next particle?

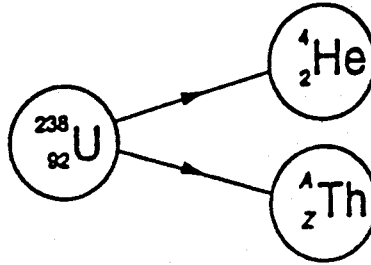
- A Atom 2 gives out the next particle.
- B Atom 4 gives out the next particle.
- C Atom 5 gives out the next particle.
- D It is impossible to tell.

39 A nuclide of the element iron has the symbol  ${}^{56}_{26}\text{Fe}$ .

What does a neutral atom of iron contain?

	<i>protons</i>	<i>neutrons</i>	<i>electrons</i>
<b>A</b>	26	30	26
<b>B</b>	26	56	30
<b>C</b>	30	26	56
<b>D</b>	56	26	30

40 The diagram represents the radioactive decay of a nucleus.



What are the values of A and Z?

	A	Z
A	238	93
B	238	92
C	236	88
D	234	90