

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

PHYSICS

0625/1

PAPER 1 Multiple Choice

Tuesday

10 NOVEMBER 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.

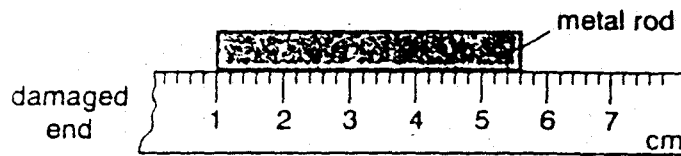
INFORMATION FOR CANDIDATES

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.

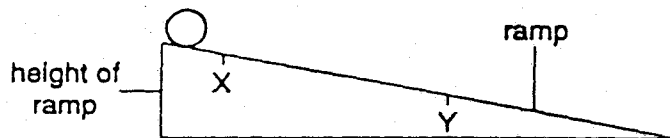
This question paper consists of 16 printed pages.

- 1 A girl uses a rule to measure the length of a metal rod. Because the end of the rule is damaged, she places one end of the rod at the 1 cm mark, as shown.



How long is the metal rod?

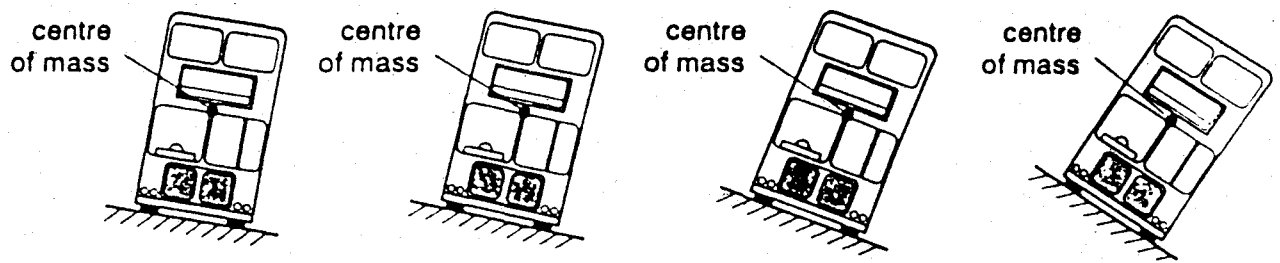
- A 43 mm B 46 mm C 53 mm D 56 mm
- 2 An object is falling freely in a vacuum near to the Earth's surface.
- Which word describes the acceleration of the object?
- A constant
B decreasing
C increasing
D zero
- 3 A ball rolls down a ramp. The time it takes to move from X to Y is measured.



- Which other quantity must be measured in order to calculate the average speed of the ball between X and Y?
- A angle of slope
B diameter of the ball
C distance between X and Y
D height of ramp
- 4 Four students make statements about mass, weight and their units. Which student's statement is correct?

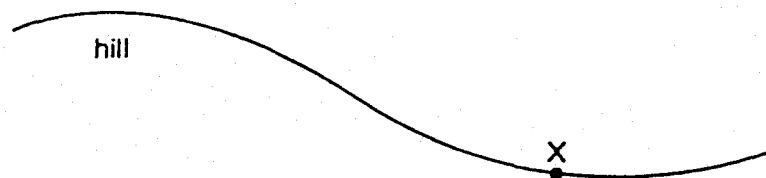
<i>student</i>	<i>statement</i>
A	'mass is a force, measured in kilograms'
B	'mass is a force, measured in newtons'
C	'weight is a force, measured in kilograms'
D	'weight is a force, measured in newtons'

- 5 The diagram shows four models of buses placed on different ramps. At first, the models are held in position.



How many of these models will fall over when released?

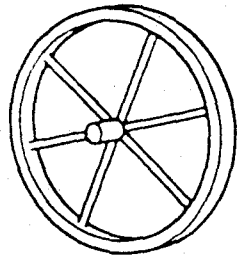
- A 1 B 2 C 3 D 4
- 6 A man jumps from an aeroplane. He falls freely.
What happens to him when his parachute opens?
- A He begins to move upwards.
B He continues falling at the same speed.
C He continues falling but at a slower speed.
D He stops moving.
- 7 A cyclist stops pedalling at the top of a hill, and then continues down the hill without pedalling. At point X, the cyclist applies his brakes and the cycle stops.



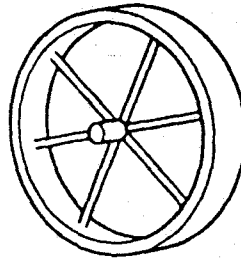
Which energy changes have taken place?

- A energy of motion \longrightarrow heat \longrightarrow energy of position
B energy of motion \longrightarrow energy of position \longrightarrow heat
C energy of position \longrightarrow heat \longrightarrow energy of motion
D energy of position \longrightarrow energy of motion \longrightarrow heat
- 8 What is used in a power station to produce electrical energy?
- A generator
B motor
C pump
D transformer

- 9 A farmer has two carts. Both carts have the same weight, but one has narrow wheels and the other has wide wheels.



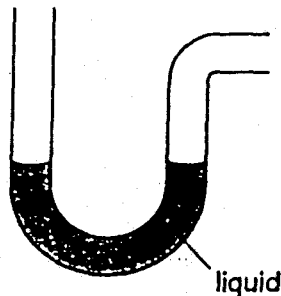
narrow wheel



wide wheel

In rainy weather, which cart sinks less into soft ground, and why?

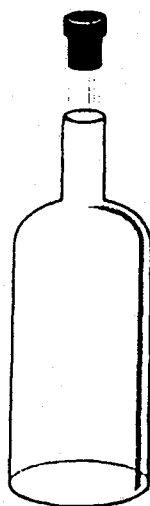
- | <i>cart wheels</i> | <i>why</i> |
|--------------------|--------------------------------|
| A narrow | greater pressure on the ground |
| B narrow | less pressure on the ground |
| C wide | greater pressure on the ground |
| D wide | less pressure on the ground |
- 10 The diagram shows an instrument used to measure gas pressure.



What is the instrument called?

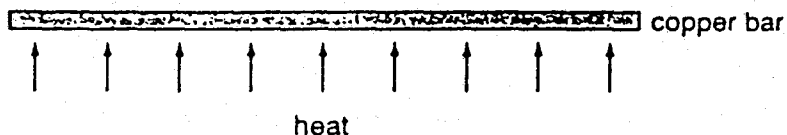
- A ammeter
 B barometer
 C forcemeter
 D manometer
- 11 When water is heated, it changes into steam.
 Which effect does this change have on the molecules?
- A They become bigger.
 B They become smaller.
 C They move closer together.
 D They move further apart.

- 12 A bottle contains only air at atmospheric pressure. It has a cork fitted tightly into its neck. The bottle is heated by sunshine. After some time, the cork pops out of the bottle.



Why does this happen?

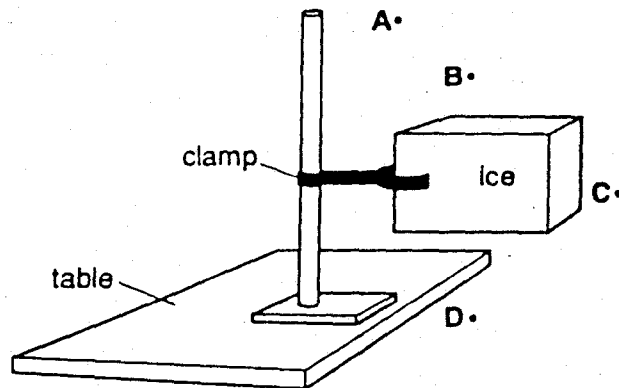
- A The heat from the Sun makes the cork contract.
 - B The heat from the Sun makes the cork expand.
 - C The heat from the Sun decreases the pressure of the air inside the bottle.
 - D The heat from the Sun increases the pressure of the air inside the bottle.
- 13 A long thin bar of copper is heated evenly along its length.



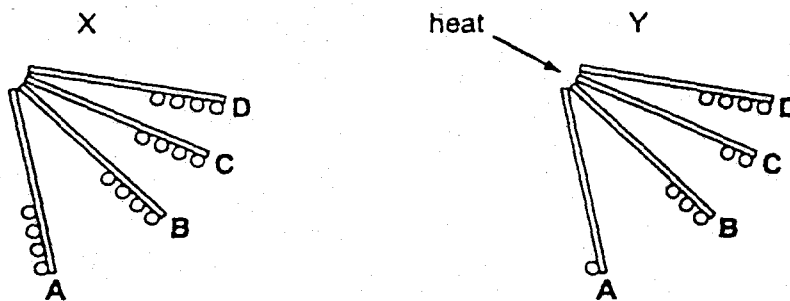
What happens to the bar?

- A It becomes lighter.
 - B It becomes longer.
 - C It becomes shorter.
 - D It bends at the ends.
- 14 To mark the lower fixed point on a centigrade thermometer, it should be placed in
- A pure alcohol.
 - B pure distilled water.
 - C pure melting ice.
 - D pure mercury.

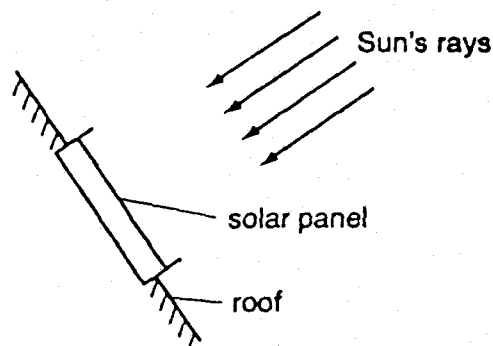
- 15 The diagram shows a block of ice placed in a warm room.
At which point is the temperature the lowest?



- 16 An experiment is set up to find out which metal is the best conductor of heat. Metal balls are stuck with wax to rods made of different metals, as shown in diagram X.
The rods are heated and some of the balls fall off, leaving some as shown in diagram Y.
Which metal is the best conductor of heat?



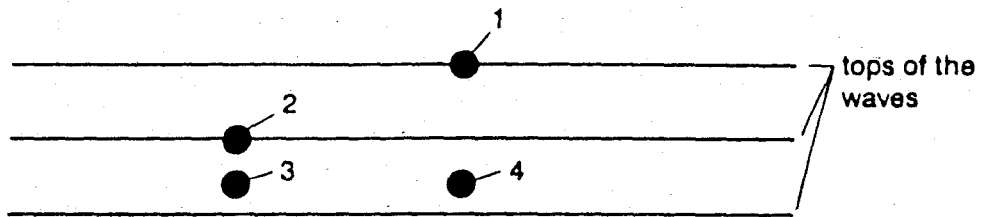
- 17 The diagram shows a solar panel



By which process is most energy gained by the panel?

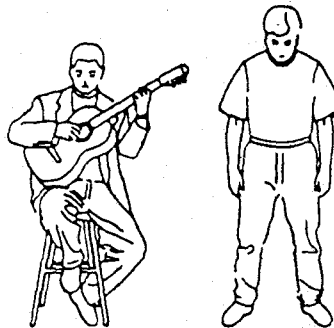
- A absorption from convection in the air
- B absorption from infra-red radiation
- C conduction from the air molecules
- D conduction from the roof

- 18 Four bottles are floating in the sea. The diagram shows the bottles from above. The lines show the tops of the waves.



Which two bottles are on the same wavefront?

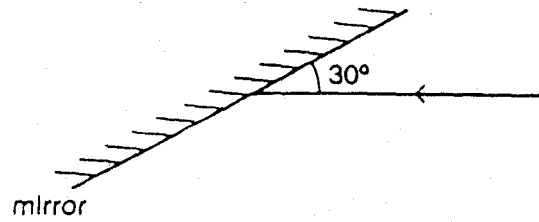
- A 1 and 2 B 1 and 4 C 2 and 3 D 3 and 4
- 19 A student plays a guitar to his teacher.



Which statement is correct?

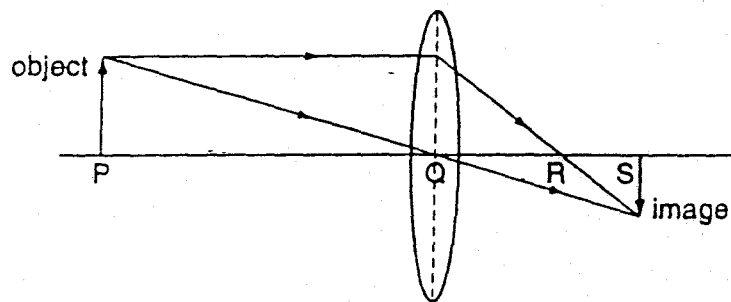
- A If the amplitude of the sound wave is small, the pitch is low.
- B If the frequency of the sound wave is low, the pitch is high.
- C Sound travels through the air as a transverse wave.
- D The teacher's ear drums vibrate at the same frequency as the sound wave.

- 20 A ray of light strikes a plane mirror.



What is the angle of reflection of the ray?

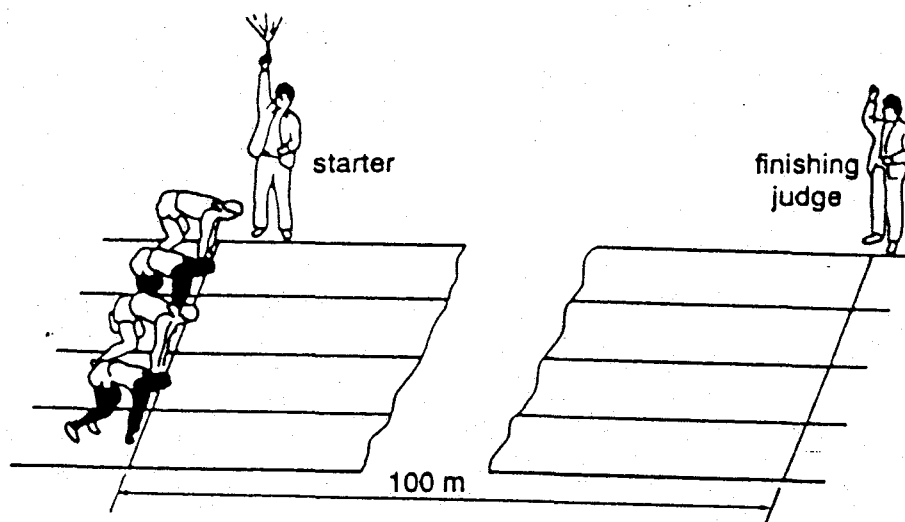
- A 150° B 90° C 60° D 30°
- 21 The diagram shows how a lens forms an image.



Which distance is the focal length of the lens?

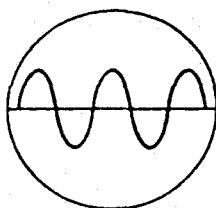
- A PQ B PS C QR D QS

- 22 A 100-metre race is started by firing a gun. As well as the sound of the explosion when the gun is fired, a puff of smoke comes out of the gun as shown.

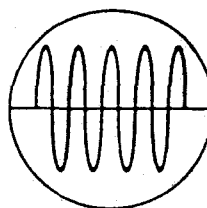


When does the finishing judge see the smoke and hear the sound?

- | | <i>sees the puff of smoke</i> | <i>hears the sound</i> |
|---|-------------------------------|------------------------|
| A | immediately | immediately |
| B | immediately | after about 0.3 s |
| C | after about 0.3 s | immediately |
| D | after about 0.3 s | after about 0.3 s |
- 23 Two sound waves, X and Y, are displayed on an oscilloscope with the same time-base and Y-plate settings for each.



X



Y

Which statement correctly describes the pitch and the loudness of the two sounds?

- A X has the higher pitch and is louder than Y.
 B X has the higher pitch and is quieter than Y.
 C X has the lower pitch and is louder than Y.
 D X has the lower pitch and is quieter than Y.

- 24 Two pieces of metal, X and Y, are found to attract each other when placed end to end.

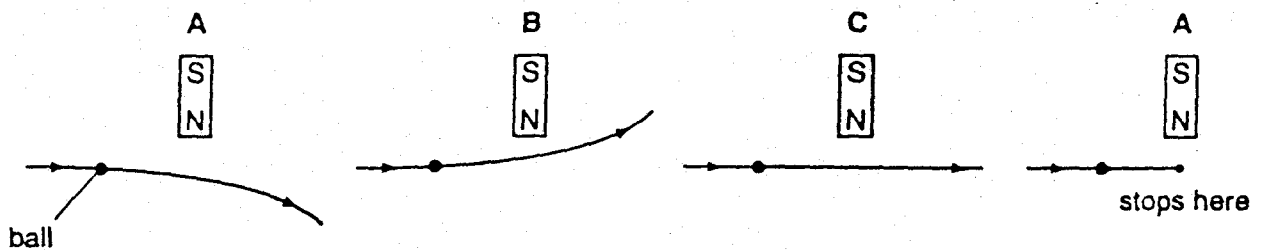


When X is turned around so that its other end faces Y, they repel.

What must be true about X and Y?

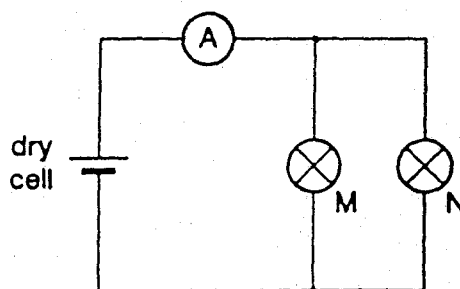
- | | X | Y |
|---|--------------|--------------|
| A | magnetised | magnetised |
| B | magnetised | unmagnetised |
| C | unmagnetised | magnetised |
| D | unmagnetised | unmagnetised |
- 25 A steel ball on a horizontal wooden table rolls near the North pole of a bar magnet which is lying on the table.

Which diagram shows the most likely path of the ball



- 26 Two identical lamps M and N are connected in parallel to a dry cell, as shown.

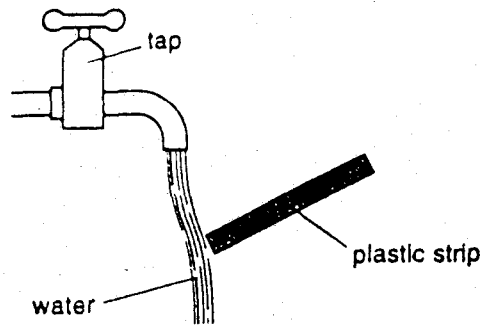
The ammeter reads 2 A.



If the lamp N is removed, the current in the ammeter will be

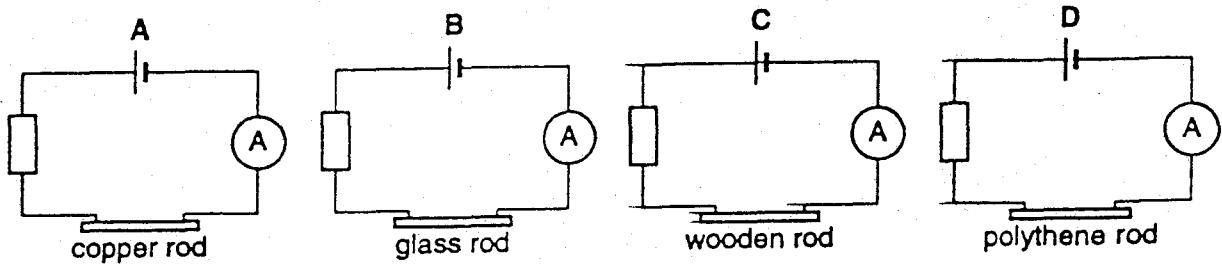
- A 2 A.
 B greater than 2 A.
 C less than 2 A.
 D zero.

- 27 A plastic strip is rubbed on a piece of cloth and held near water running slowly from a tap. The water moves towards the plastic strip.

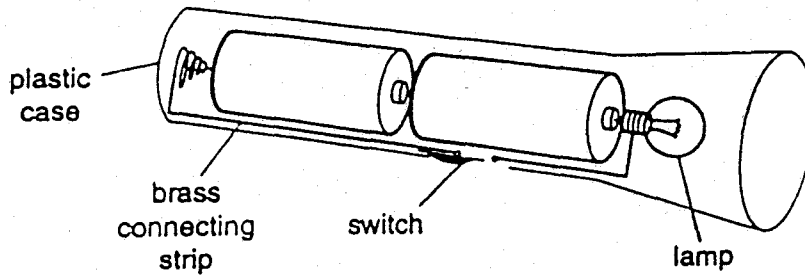


Why does this happen?

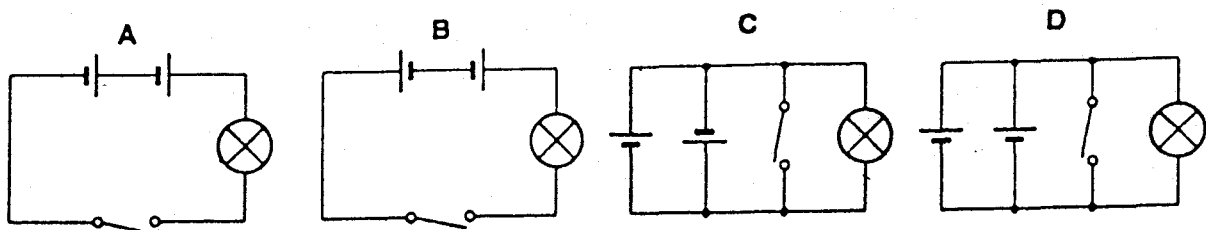
- A The plastic strip cools the water.
 - B The plastic strip warms the water.
 - C There is a magnetic force on the water.
 - D There is an electrostatic force on the water.
- 28 In which circuit is there a reading on the ammeter?



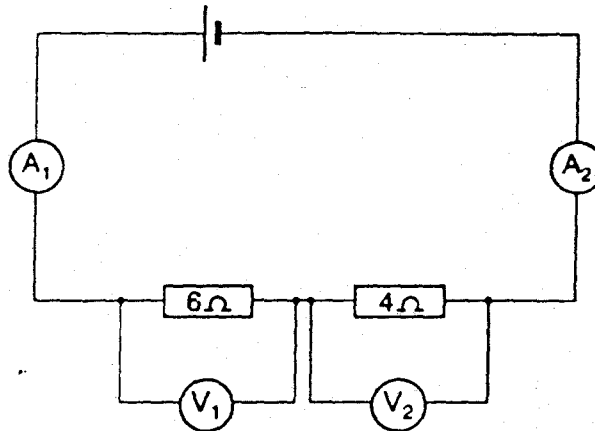
- 29 The diagram shows a torch containing two 2 V cells, a switch and a lamp.



What is the circuit diagram for the torch?

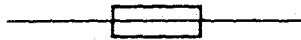


- 30 The diagram shows a series circuit that includes two ammeters and two voltmeters.



How do the readings on the meters in the circuit compare?

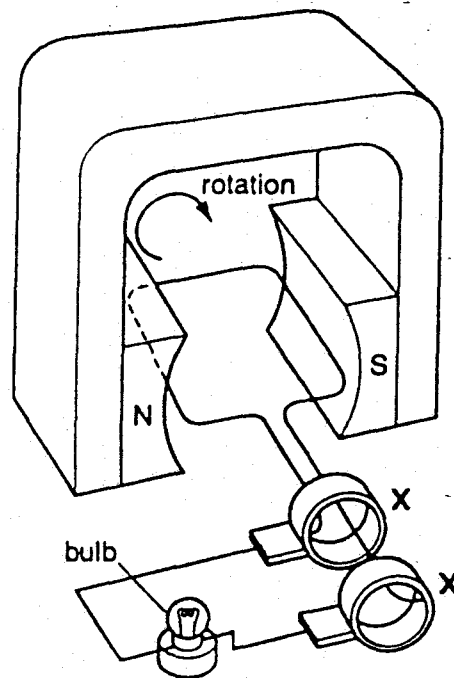
- | <i>reading on A_1</i> | <i>reading on V_1</i> |
|------------------------------------|------------------------------------|
| A equal to reading on A_2 | less than reading on V_2 |
| B equal to reading on A_2 | greater than reading on V_2 |
| C greater than reading on A_2 | greater than reading on V_2 |
| D greater than reading on A_2 | less than reading on V_2 |
- 31 The diagram shows the circuit symbol for an electrical component.



What is the name and purpose of the component?

- | <i>name</i> | <i>purpose</i> |
|-------------|---|
| A fuse | to allow current in one direction only |
| B fuse | to break the circuit when the current becomes too large |
| C resistor | to allow current in one direction only |
| D resistor | to break the circuit when the current becomes too large |

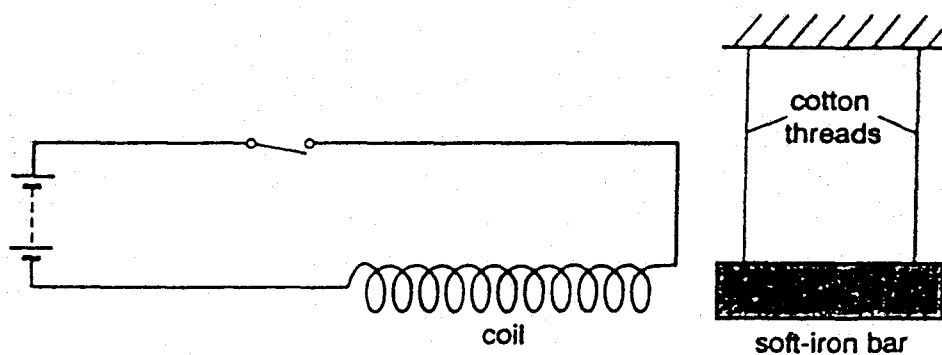
32 The diagram shows a simple alternating current generator.



What are the parts marked X?

- A carbon brushes
- B coils of wire
- C magnets
- D slip rings

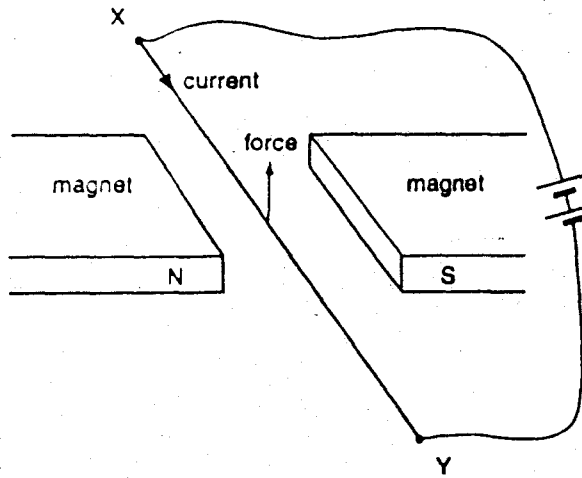
33 A soft-iron bar hangs from cotton threads near a coil of wire, as shown.



What happens to the soft-iron bar when the current in the coil is switched on?

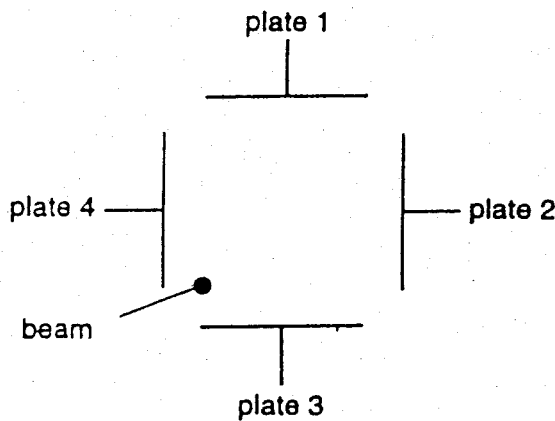
- A It does not move.
- B It moves away from the coil.
- C It moves towards the coil.
- D It rotates.

34 When the electric current in wire XY is in the direction shown, there is an upward force on the wire.



If the north and south poles exchange positions, in which direction will the force on the wire act?

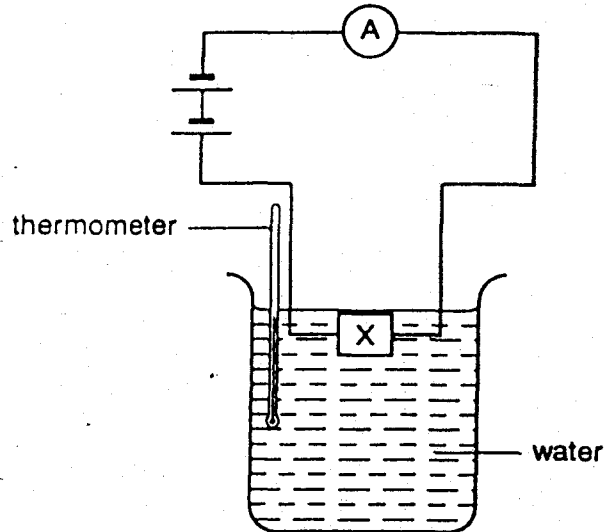
- A downward
 - B upward
 - C to the left
 - D to the right
- 35 In an oscilloscope, a beam of cathode rays (electrons) travels toward you (out of the page). passes between four metal plates. When the plates are not charged, the beam passes centrally between the plates. The plates are then charged either positively or negatively. The dot on the diagram shows where the beam comes out from between the plates.



What are the charges on the plates?

	plate 1	plate 2	plate 3	plate 4
A	+	+	-	-
B	+	-	-	+
C	-	+	+	-
D	-	-	+	+

- 36 An electrical component X is placed in water, as shown.



When the temperature of the water is increased, the reading on the ammeter increases.

What is component X?

- A capacitor
 - B light-dependent resistor
 - C reed relay
 - D thermistor
- 37 An astronaut explores a new planet wearing a suit lined with lead. He becomes ill on returning to Earth. Doctors find that he had been exposed to too much radiation. The planet is known to emit α -, β - and γ -radiation.

Which radiation has made him ill?

- A α -radiation only
 - B β -radiation only
 - C γ -radiation only
 - D α -radiation and γ -radiation
- 38 ${}^{220}_{88}\text{Ra}$ decays by emitting an α -particle to form a new element.

Which element is formed?

- A ${}^{222}_{90}\text{Th}$
- B ${}^{220}_{87}\text{Fr}$
- C ${}^{216}_{84}\text{Po}$
- D ${}^{216}_{86}\text{Rn}$

39 Which diagram could represent a nucleus of ${}^3_1\text{H}$?

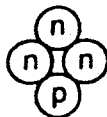
A



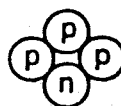
B



C



D



key

(n) = a neutron

(p) = a proton

40 Which particle has about the same mass as a proton but no charge?

A an α -particle

B an ion

C a nucleus

D a neutron