Conservation of Energy and Power and Energy Forms 4

Q:1 Energy is supplied to a microwave oven by mains electricity.

The oven transforms this energy in various ways.

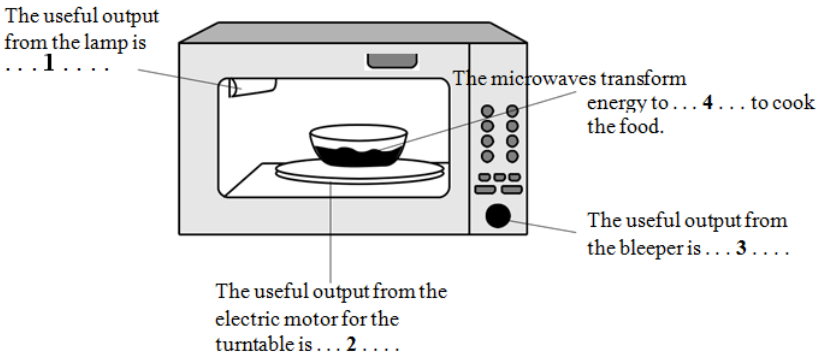
Match words, A, B, C and D, with the numbers 1– 4 in the sentences.

A heat

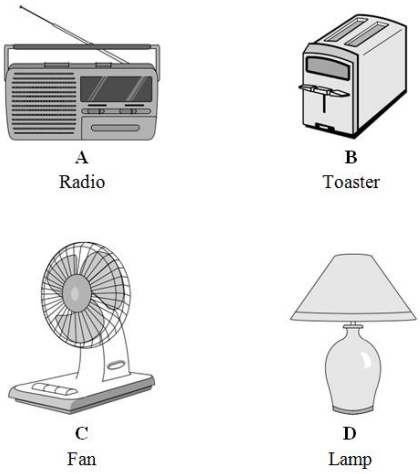
B light

C movement

D sound



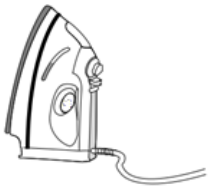
Q:2 This question is about useful energy transformations in domestic appliances.



Match appliances, A, B, C and D, with the statements 1– 4 in the table.

	Useful energy transformations
1	electrical to heat
2	electrical to kinetic
3	electrical to light
4	electrical to sound

Q:3 These devices transform electrical energy into other useful forms of energy.



1
Iron

2
MP3 player

3
Head torch

4
Vacuum cleaner

Match the useful forms of energy, A, B, C and D, with the devices 1– 4.

A heat (thermal energy)

B light

C movement (kinetic energy)

D sound

Q:4 The table shows the power of four electrical appliances found in a home.

	Appliance	Power in watts
A	electric kettle	2000
B	electric oven	4000
C	electric shower	8000
D	flat-screen television	200

energy transferred (kilowatt-hour, kWh)	=	power (kilowatt, kW)	×	time (hour, h)

Match appliances, A, B, C and D, with the numbers 1– 4 in the sentences.

Each appliance is used for 3 minutes. The one that transfers the most energy is the . . . 1 . . . .

The appliance that has a power of 2 kW is the . . . 2 . . . .

The appliance that is not designed to produce heat (thermal energy) is the . . . 3 . . . .

The appliance that transfers electrical energy at half the rate of the shower is the . . . 4 . . . .

Q:5 This question is about useful energy transformations by different electrical devices.

Match devices, A, B, C and D, with the useful energy transformations 1– 4 in the table.

A computer monitor

B loudspeaker

C microphone

D solar cell

	Useful energy transformations
1	electrical energy into light energy
2	sound energy into electrical energy
3	electrical energy into sound energy
4	light energy into electrical energy

Q:6 The picture shows a mobile phone.

The phone can be left switched on in 'silent' mode. In this mode, the phone vibrates when there is a call.

Match words, A, B, C and D, with the numbers 1– 4 in the sentences.

A electrical

B kinetic

C light

D sound

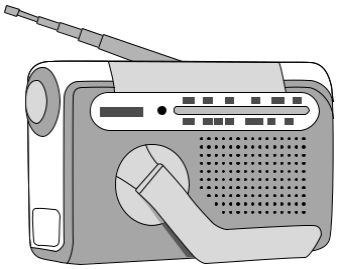
The output from the screen of the mobile phone is . . . 1 . . . energy.

When the phone is used, the loudspeaker produces . . . 2 . . . energy.

When the phone is used, the microphone produces . . . 3 . . . energy.

When a call is received in 'silent' mode, the mobile phone produces . . . 4 . . . energy.

Q:7 The diagram shows a clockwork radio.



Turning the handle winds up a spring. When the spring unwinds, it turns a small generator.

The generator provides the energy to operate the radio.

Match types of energy, A, B, C, and D, with the numbers 1– 4 in the sentences.

A elastic potential (strain)

B electrical

C kinetic

D sound

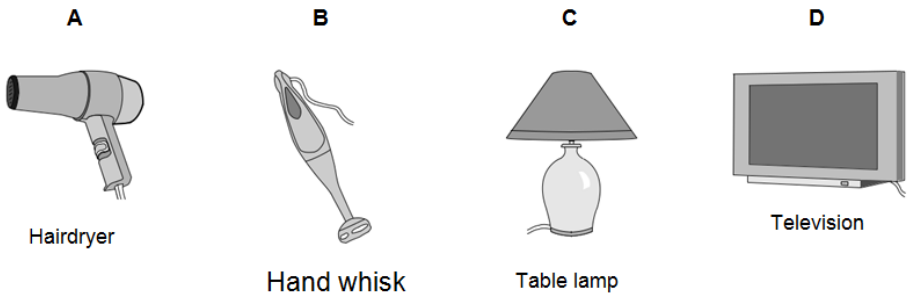
When the spring is wound up, energy is stored as . . . 1 . . . energy.

When the spring unwinds, the stored energy is transformed into . . . 2 . . . energy.

As the generator turns, it produces . . . 3 . . . energy.

The loudspeaker in the radio gives out . . . 4 . . . energy.

Q:8 The diagrams show four electrical appliances. Each appliance is designed to produce useful energy but some energy is wasted.

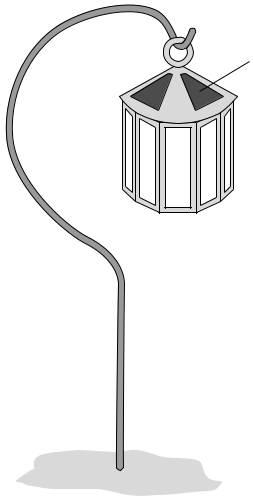


Match appliances, **A**, **B**, **C** and **D**, with the numbers **1– 4** in the table.

	Designed to produce . . .	Also produces wasted . . .
1	thermal energy (heat) and kinetic energy	sound energy
2	kinetic energy	sound energy and thermal energy (heat)
3	light energy	thermal energy (heat)
4	light energy and sound energy	thermal energy (heat)

Q:9 A garden light has panels of solar cells that collect energy from the Sun. The energy is transformed for storage in rechargeable batteries. The stored energy is used to power the lamp when it is dark.

Solar cells



Match energy transformations, A, B, C and D, with the numbers 1– 4 in the table.

A chemical energy to electrical energy

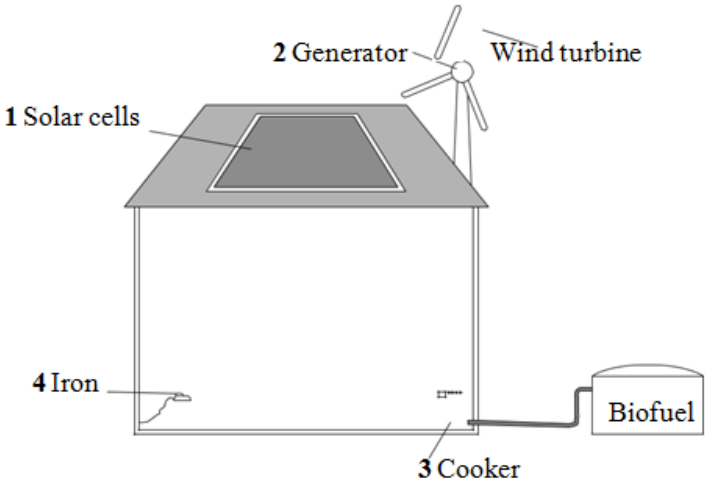
B electrical energy to chemical energy

C electrical energy to light energy

D light energy to electrical energy

	Where and when the transformation takes place
1	in the batteries during darkness
2	in the batteries during daylight
3	in the lamp during darkness
4	in the solar cells during daylight

Q:10 The diagram shows an eco-friendly house.



Match energy transformations, A, B, C and D, with the devices 1–4 in the diagram.

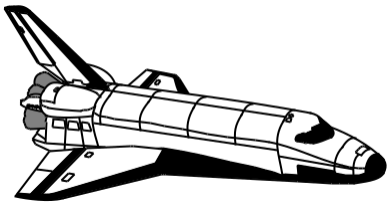
A chemical energy to heat

B electrical energy to heat

C light energy to electrical energy

D kinetic energy to electrical energy

Q:11 The diagram shows the space shuttle returning to Earth. As it moves towards Earth, it moves faster.



Match forms of energy, A, B, C and D, with the numbers 1–4 in the sentences.

A gravitational potential energy

B kinetic energy

C light energy

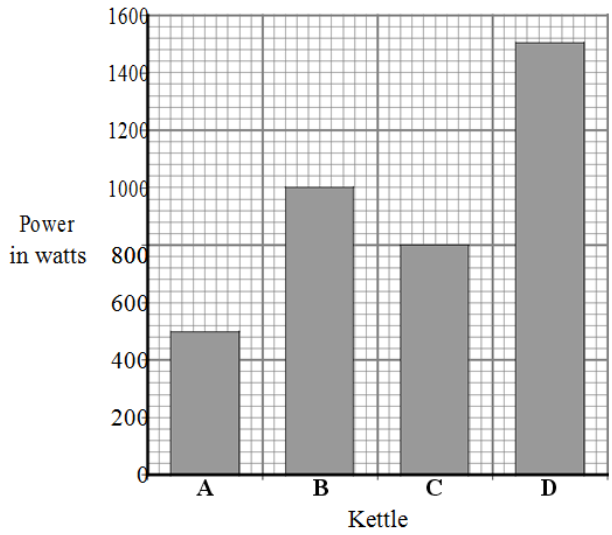
D thermal energy

As the shuttle moves towards Earth, it loses . . . 1 . . . .

When the shuttle moves faster, it gains . . . 2 . . . .

When the shuttle enters the Earth's atmosphere, there is a lot of friction. This makes the tiles covering the shuttle glow red. As a result, the shuttle gives off a lot of . . . 3 . . . and a little . . . 4 . . . .

Q:12 The bar chart shows the power of four different electric kettles, A, B, C and D.



Match kettles, A, B, C and D, with the numbers 1– 4 in the sentences.

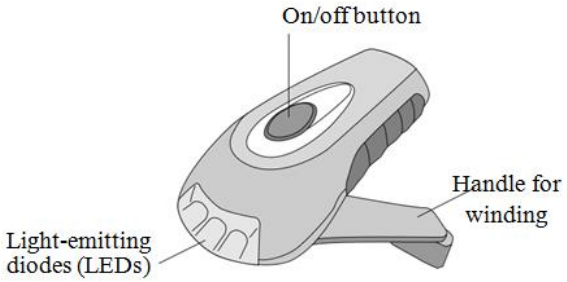
The kettle with the highest power is kettle . . . 1 . . . .

The kettle with a power of 800 W is kettle . . . 2 . . . .

The kettle with a power of 1 kW is kettle . . . 3 . . . .

Each kettle contains the same volume of water at 20 °C. The kettle that takes the longest time to boil the water is kettle . . . 4 . . . .

Q:13 The diagram shows a torch which contains a rechargeable battery. The battery is recharged by winding the handle.



Match words, A, B, C and D, with the numbers 1– 4 in the sentences.

A chemical

B electrical

C kinetic

D light

When the user winds the handle, the useful energy transformation is from . . . 1 . . . energy to . . . 2 . . energy which is stored in the battery.

When the torch is switched on, the useful output from the battery is . . . 3 . . . energy and the useful output from the LEDs is . . . 4 . . . energy.

Q:14 An inventor has designed a way of charging a mobile phone battery as a person is walking.

The charger unit contains a generator. The unit is strapped to a leg.

Match words, A, B, C and D, with the numbers 1– 4 in the sentences.

A chemical

B electrical

C heat

D kinetic

As the person walks, . . . 1 . . . energy from food is transformed to . . . 2 . . . energy of the moving legs.

The generator produces useful . . . 3 . . . energy.

Some energy is wasted as . . . 4 . . . .

Q:15 The drawing shows a mobile phone. This phone also has a digital camera.

Match the energy transformations, A, B, C and D, with the statements 1– 4 in the table.

A electrical to light

B electrical to sound

C light to electrical

D sound to electrical

1	the useful energy transformation in the display screen
2	the useful energy transformation in the loudspeaker
3	the useful energy transformation in the microphone
4	the useful energy transformation in the digital camera

Q:16 A gym uses exercise bikes to generate electricity.

Match types of energy, A, B, C and D, with the numbers 1– 4 in the sentences.

A chemical

B electrical

C heat (thermal energy)

D kinetic

The bike riders transform . . . 1 . . . energy from food into . . . 2 . . . energy of the pedals.

A generator produces . . . 3 . . . energy.

Some energy is wasted as . . . 4 . . . .

TOTAL MARKS=64