Energy transfers in appliances - cost and power

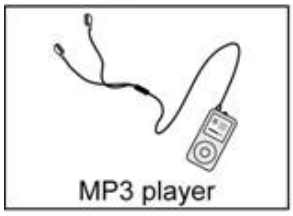
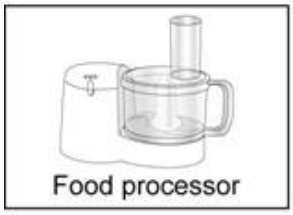
91 minutes

93 marks

Q1. The diagrams in **List A** show three electrical appliances. Each appliance is designed to transfer electrical energy.

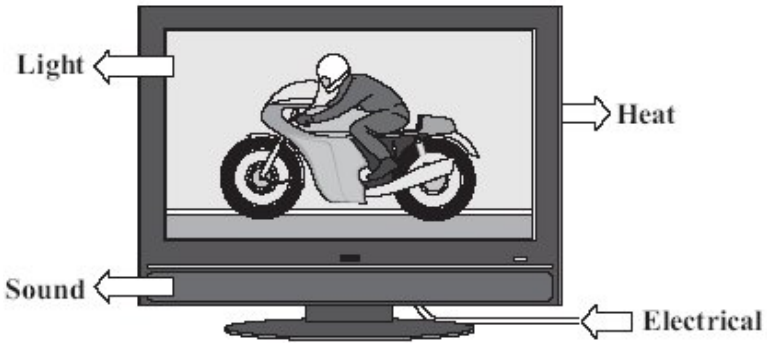
Draw **one** straight line from each appliance in **List A** to the useful energy output produced by that appliance in **List B**.

Draw only **three** lines.

List A Appliance	List B Useful energy output
 MP3 player	Light
 Food processor	Sound
 Desk lamp	Electrical
	Kinetic

(Total 3 marks)

Q2. The diagram shows the energy transformations produced by a TV.



(a) Use words from the diagram to complete the following sentence.

The TV is designed to transform ..... energy into

light and ..... energy.

(2)

(b) Which **one** of the following statements is **false**?

Put a tick (✓) in the box next to the **false** statement.

The energy transformed by the TV makes the surroundings warmer. ☐

The energy transformed by the TV becomes spread out. ☐

The energy transformed by the TV will be destroyed. ☐

(1)

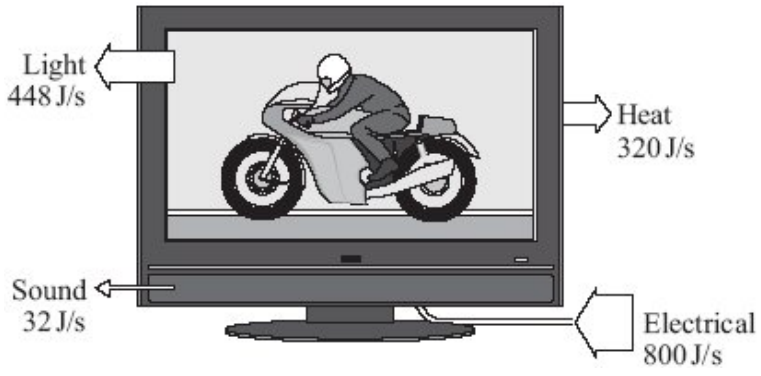
(c) Two different makes of television, **A** and **B**, transform energy at the same rate. Television **A** wastes less energy than television **B**.

Complete the following sentence by drawing a ring around the correct line in the box.

Television **A** has [a higher efficiency than / the same efficiency as / a lower efficiency than] television **B**.

(1)
(Total 4 marks)

Q3. (a) The diagram shows the energy transformations produced by a TV.



(i) Use the information in the diagram and the equation in the box to calculate the efficiency of the TV.

$$\text{efficiency} = \frac{\text{useful energy transferred by the device}}{\text{total energy supplied to the device}}$$

Show clearly how you work out your answer.

.....

.....

Efficiency = ...

(2)

(ii) What eventually happens to the useful energy transferred by the TV?

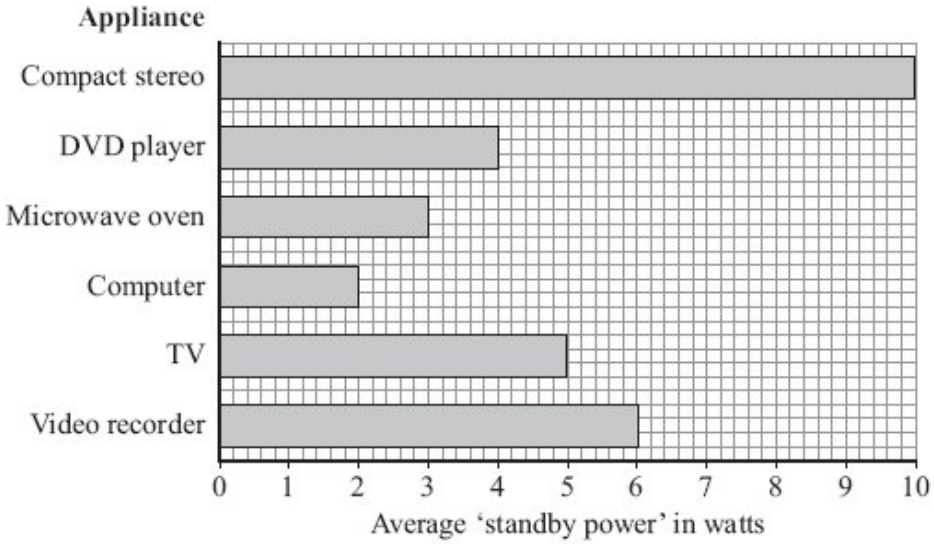
.....

.....

(1)

(b) Electrical appliances left on standby use energy.

The bar chart shows the power for the appliances that one family leaves on standby when they go on holiday.



The family is on holiday for a total of 175 hours.

(i) Use the information in the bar chart and the equation in the box to calculate the energy wasted by leaving the compact stereo on standby while the family is on holiday.

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

Show clearly how you work out your answer.

.....

.....

Energy wasted = ... kilowatt-hours

(2)

(ii) Electricity costs 12 p per kilowatt-hour.

Use the equation in the box to calculate the cost of leaving the compact stereo on standby while the family is on holiday.

total cost = number of kilowatt-hours × cost per kilowatt-hour

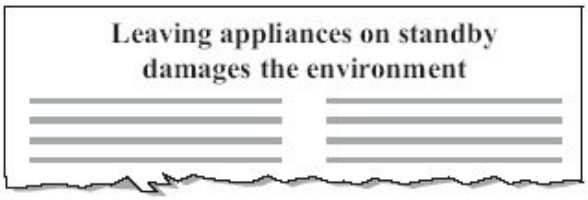
Show clearly how you work out your answer.

.....

Cost = ... p

(1)

(c) A headline from a recent newspaper article is shown below.



Explain why leaving appliances on standby damages the environment.

.....

.....

.....

.....

(2)

(Total 8 marks)

Q4. (a) The picture shows a new washing machine.

Complete the following sentence using **one** of the words in the box.

kinetic	**light**	**sound**

A washing machine is designed to transform electrical energy into heat and

..... energy

(1)

(b) The instruction booklet for the washing machine contains the following information.

Wash cycle	Average power during cycle	Time taken to run cycle
HOT	1.5 kW	2 hours
COOL	1.1 kW	1½ hours
FAST	1.0 kW	¾ hour

(i) Use the following equation to calculate the energy transferred, in kilowatt-hours, to the washing machine during the HOT wash cycle. Show how you work out your answer.

energy transferred = power × time

.....

.....

Energy transferred = ... kWh

(2)

(ii) Why does it cost more to use the washing machine on the HOT cycle than on the COOL or FAST cycle?

.....

.....

(1)

(iii) Before buying a washing machine, a householder researched several makes to find out which washing machine was the most energy efficient.

Write down **one** way that he could have done this research.

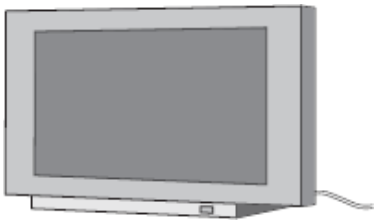
.....

.....

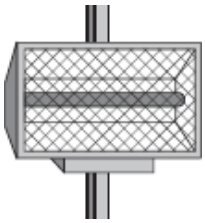
(1)

(Total 5 marks)

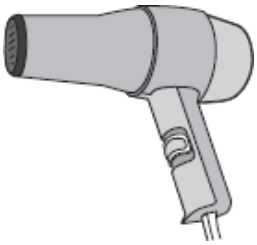
Q5. The data included in the diagrams gives the power of the electrical appliances.



TV
160 W

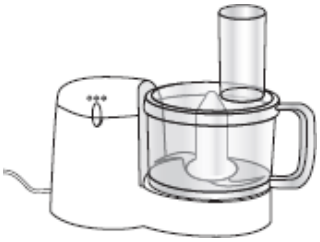


Radiant heater
1.0 kW



Hairdryer
1100 W

Sandwich toaster
1.1 kW



Food processor
0.4 kW

Table lamp
40 W

(a) (i) Which appliance is designed to transform electrical energy to light and sound?

.....

(1)

(ii) Which **two** appliances transform energy at the same rate?

..... and .....

(1)

(b) During one week, the food processor is used for a total of 3 hours.

(i) Use the equation in the box to calculate the energy transferred, in kilowatt-hours, by the food processor in 3 hours.

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

Show clearly how you work out your answer.

.....

.....

.....

.....

Energy transferred = ... kWh

(2)

(ii) Electricity costs 15 pence per kilowatt-hour.

Use the equation in the box to calculate the cost of using the food processor for 3 hours.

total cost	=	number of kilowatt-hours	×	cost per kilowatt-hour

Show clearly how you work out your answer.

.....

.....

.....

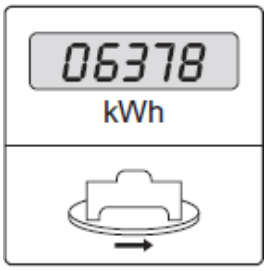
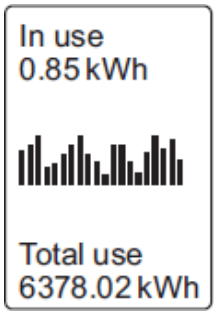
.....

Cost = ... pence

(2)

(c) A homeowner decides to monitor the amount of electrical energy used in his home.

He can do this by using an electricity meter or by using a separate electronic device.

Electricity meter	Electronic device
Records to the nearest kilowatt-hour	Records to the nearest 1/100th kilowatt-hour
	

(i) Use one word from the box to complete the following sentence.

precise	reliable	valid

The reading given by the electronic device is more ..... than the reading given by the electricity meter.

(1)

(ii) Monitoring the electrical energy used in a home may help people to save money by encouraging them to use less electricity.

Explain why, apart from saving money, it is important for people to use less electricity.

.....

.....

.....

.....

(2)

(Total 9 marks)

Q6. The picture shows a food processor, which is used to grate, shred, liquidise and mix food. The table gives some information about the food processor.

Energy input	Electrical
Useful energy output	Kinetic
Power rating	1200 watts
Efficiency	0.8

(a) The food processor is used for a total of 30 minutes a day.

Calculate the cost of the energy **wasted** by the food processor each day.

Electricity costs 15 p per kilowatt-hour.

Write down the equations you use, and then show clearly how you work out your answer.

.....

.....

.....

.....

.....

Cost of **waste** energy = ... p

(4)

(b) Explain what happens to the waste energy.

.....

.....

.....

.....

.....

(2)

(Total 6 marks)

##

(a) (i) Complete the sentence by choosing the correct word from the box.

electrons	neutrons	protons

An electric current is a flow of .....

(1)

(ii) What is the name and circuit symbol for the instrument used to measure electric current?

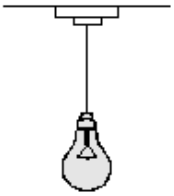
Name: .....

Symbol:

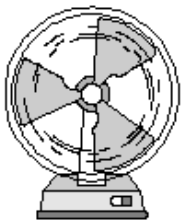
(2)

(b) When an electric current flows through a wire, the wire will get hot. **Two** of the following make use of this heating effect. Which **two**?

Microwave oven



Light bulb



Fan

Hairdryer

1. .....

2. .....

(2)

(c) A 0.2 kW light bulb is switched on for 3 hours.

Use the following equation to calculate, in kWh, how many units of electrical energy are transferred to the bulb during the 3 hours.

units = power × time

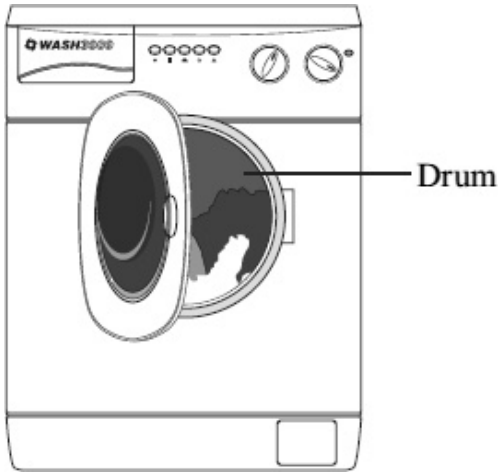
.....

Number of units = kWh .....

(2)

(Total 7 marks)

Q8. The picture shows a new washing machine. When the door is closed and the machine switched on, an electric motor rotates the drum and washing.



(a) Complete the following sentences.

(i) An electric motor is designed to transform electrical energy into

..... energy.

(1)

(ii) Some of the electrical energy supplied to the motor is wasted as

..... energy and ..... energy.

(1)

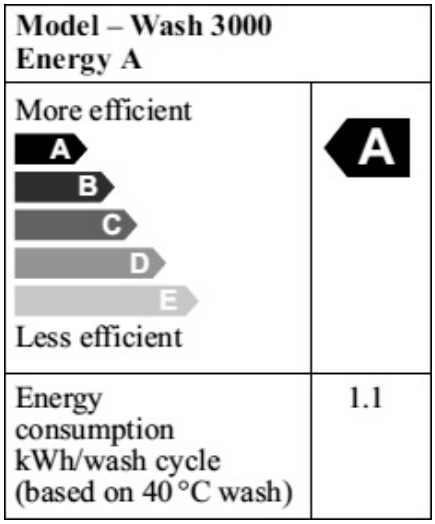
(b) What happens to the energy wasted by the electric motor?

.....

.....

(1)

(c) The diagram shows the label from the new washing machine.



An ‘A’ rated washing machine is *more energy efficient* than a ‘C’ rated washing machine.

Explain what being *more energy efficient* means.

.....

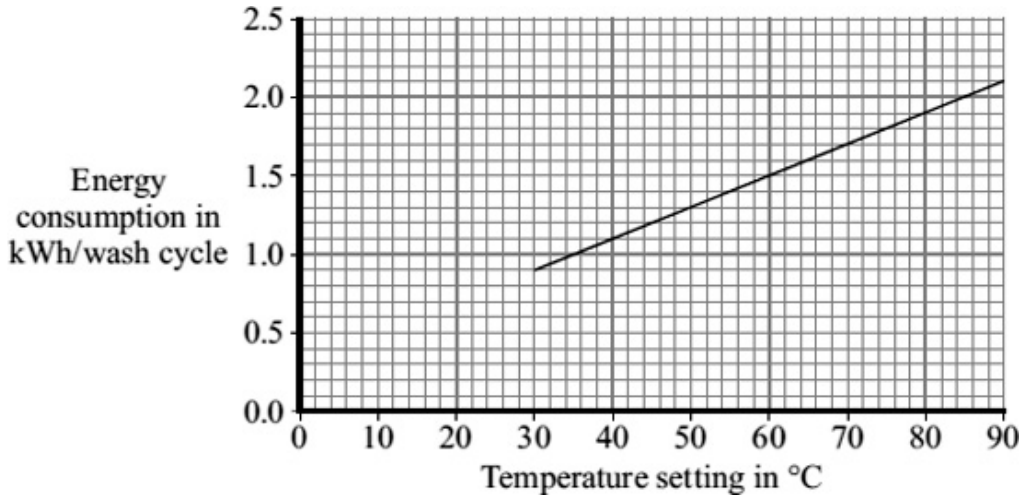
.....

.....

.....

(2)

(d) The graph shows that washing clothes at a lower temperature uses less energy than washing them at a higher temperature. Using less energy will save money.



(i) Electricity costs 12 p per kilowatt-hour (kWh).
The temperature setting is turned down from 40 °C to 30 °C.

Use the graph and equation in the box to calculate the money saved each wash cycle.

total cost = number of kilowatt-hours × cost per kilowatt-hour

Show clearly how you work out your answer.

.....

.....

Money saved = ... p

(2)

(ii) Suggest why reducing the amount of energy used by washing machines could reduce the amount of carbon dioxide emitted into the atmosphere.

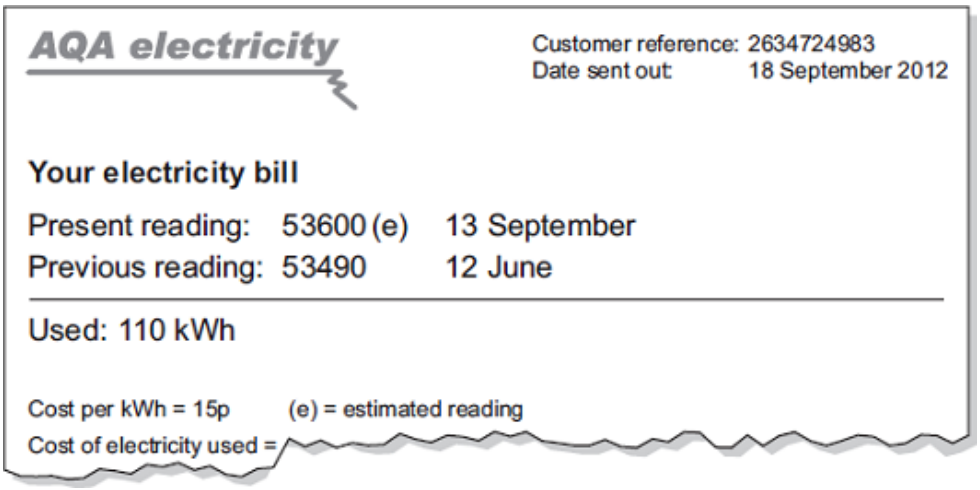
.....

.....

(1)

(Total 8 marks)

Q9. A householder was out shopping when her electricity meter reading should have been taken. The electricity company estimated the reading and sent the following bill. Unfortunately, the bill was damaged in the post.



(a) Use the equation in the box to calculate the cost of the electricity used between 12 June and 13 September.

total cost = number of kilowatt-hours x cost per kilowatt-hour

Show clearly how you work out your answer.

.....

.....

Total cost = ...

(2)

(b) The estimated reading shown on the bill was not very accurate. The correct reading was 53782.

How many kilowatt-hours of electricity had the householder actually used between 12 June and 13 September?

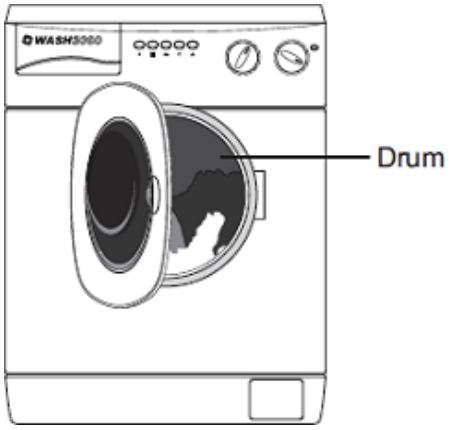
.....

.....

(2)

(Total 4 marks)

Q10. The picture shows a washing machine. When the door is closed and the machine switched on, an electric motor rotates the drum and washing.



(a) Complete the following sentences.

(i) An electric motor is designed to transform electrical energy into

..... energy.

(1)

(ii) Some of the electrical energy supplied to the motor is wasted as

..... energy and ..... energy.

(1)

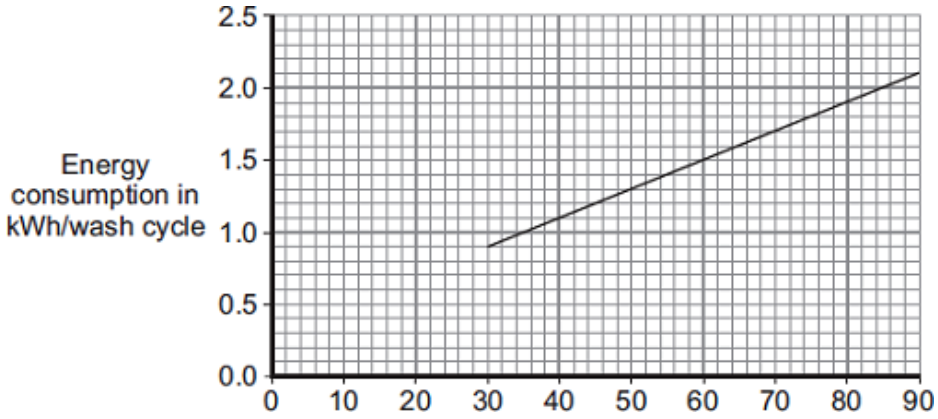
(b) What happens to the energy wasted by the electric motor?

.....

.....

(1)

(c) The graph shows that washing clothes at a lower temperature uses less energy than washing them at a higher temperature. Using less energy will save money.



(i) Electricity costs 15p per kilowatt-hour (kWh).

The temperature setting is turned down from 40 °C to 30 °C.

Use the graph and equation in the box to calculate the money saved each wash cycle.

total cost = number of kilowatt-hours x cost per kilowatt-hour

Show clearly how you work out your answer.

.....

.....

Money saved = ...

(2)

(ii) Reducing the amount of energy used by washing machines could reduce the amount of carbon dioxide emitted into the atmosphere.

Explain why.

.....

.....

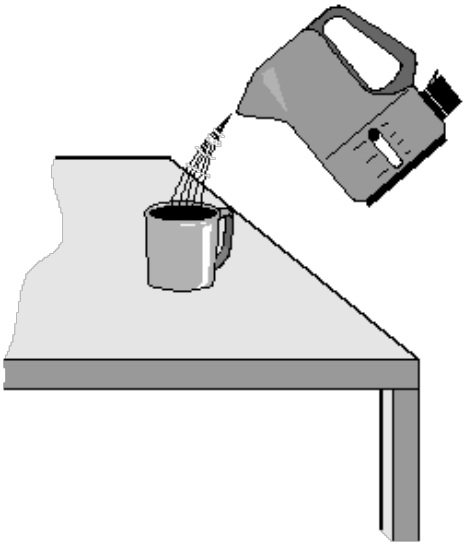
.....

.....

(2)

(Total 7 marks)

Q11. (a) The diagram shows hot water being poured into a mug.



(i) Complete the sentence by choosing the correct words from the box. Each word may be used once or not at all.

air	mug	table	water

Heat energy is being transferred from the ..... to

the ..... .

(1)

(ii) When will this transfer of heat energy stop?

.....

.....

(1)

(b) In the box are the names of four types of fuel used to heat homes.

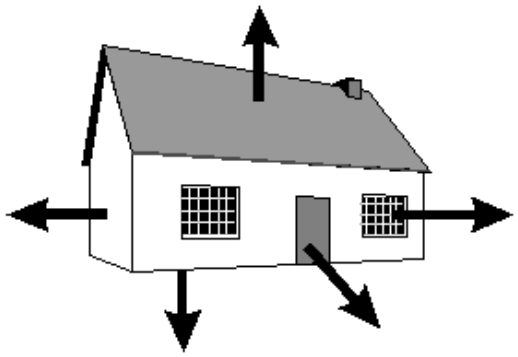
coal	gas	oil	wood

Which **one** of these types of fuel is renewable?

.....

(1)

(c) The diagram shows where heat energy is lost from a house.



(i) Complete the sentences by choosing the correct words from the box. Each word may be used once or not at all.

conduction	conductor	convection	electric	evaporation	insulator

The amount of heat energy lost through the windows by

..... can be reduced by using thick curtains. The

curtains trap a layer of air and air is a good ..... .

The curtains will also stop ..... currents pulling

cold air into the room through small gaps in the window.

(3)

(ii) Write down **one** other way of reducing heat loss from a house.

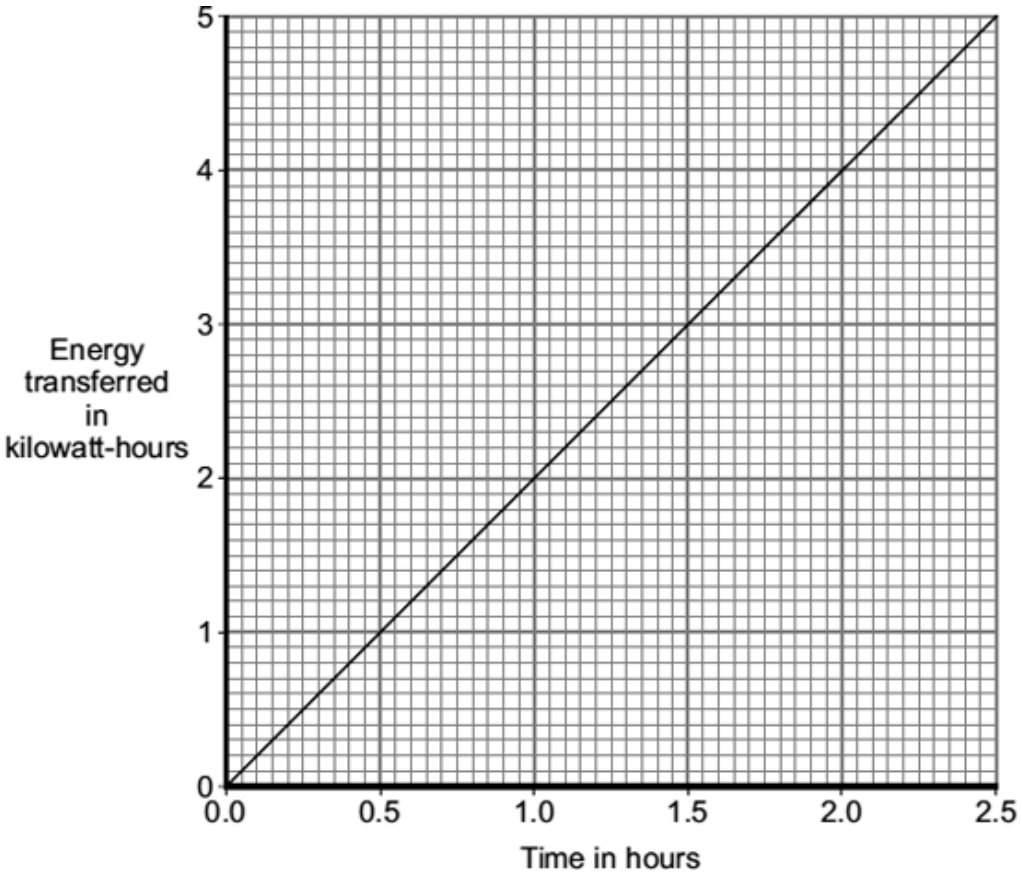
.....

.....

(1)

(Total 7 marks)

Q12. The graph shows how the energy transferred by a 2 kW electric kettle varies with the time, in hours, that the kettle is switched on.



(a) In one week, the kettle is used for a total of 1.5 hours.
Electricity costs 15 p per kilowatt-hour.

Use the equation in the box to calculate the cost of using the kettle for the week.

total cost = number of kilowatt-hours × cost per kilowatt-hour

Show clearly how you work out your answer.

.....

.....

Cost = ... p

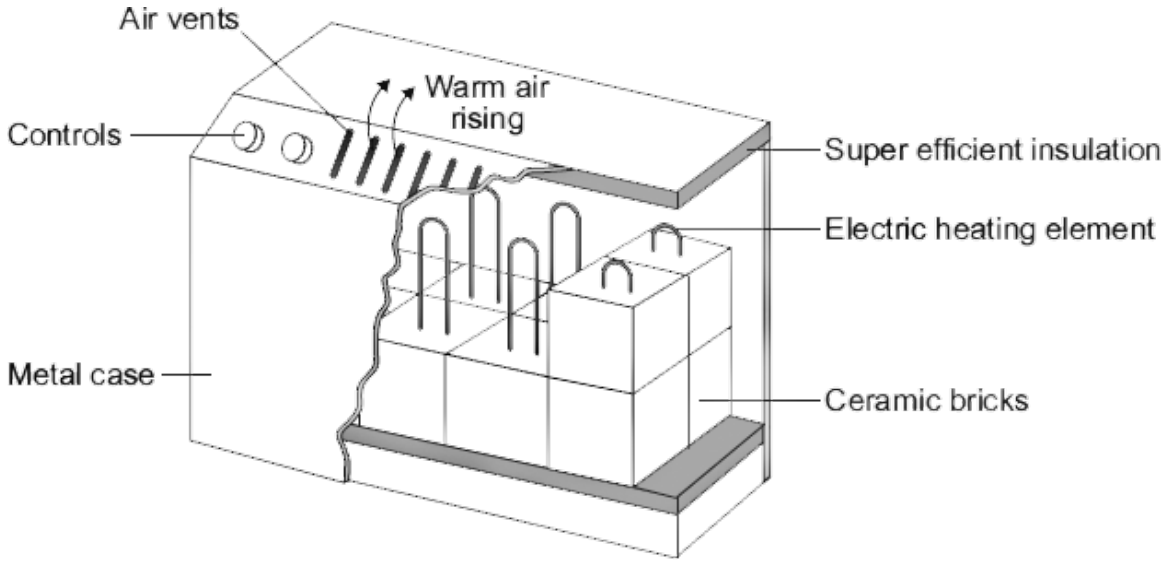
(2)

(b) Draw a new line on the graph to show how the energy transferred by a 1 kW kettle varies with time.

(1)

(Total 3 marks)

Q13. The diagram shows how one type of electric storage heater is constructed. The heater has ceramic bricks inside. The electric elements heat the ceramic bricks during the night. Later, during the daytime, the ceramic bricks transfer the stored energy to the room.



(a) (i) Complete the following sentences using words from the box.

conduction	**convection**	**evaporation**

Energy is transferred through the metal casing by .....

The warm air rising from the heater transfers energy to the

room by .....

(2)

(ii) The inside of the metal case is insulated.

Which **one** of the following gives the reason why?

Tick (✓) **one** box.

To transfer energy from the ceramic bricks to the room faster ☐

To stop energy from the room transferring into the heater ☐

To keep the ceramic bricks hot for a longer time ☐

(1)

(b) In winter, the electricity supply to a 2.6 kW storage heater is switched on for seven hours each day.

(i) Calculate the energy transferred, in kilowatt-hours, from the electricity supply to the heater in seven hours.

Use the correct equation from the Physics Equations Sheet.

Show clearly how you work out your answer.

.....

.....

Energy transferred = ... kWh

(2)

(ii) The electricity supply to the heater is always switched on between midnight and 7 am. Between these hours, electricity costs 5 p per kilowatt-hour.

Calculate how much it costs to have the heater switched on between midnight and 7 am.

.....

.....

Cost = ... p

(1)

(c) Between 7 am and 8 am, after the electricity supply is switched off, the temperature of the ceramic bricks falls by 25 °C.

Calculate the energy transferred from the ceramic bricks between 7 am and 8 am.

Total mass of ceramic bricks = 120 kg.
Specific heat capacity of the ceramic bricks = 750 J/kg °C.

Use the correct equation from the Physics Equations Sheet.

Show clearly how you work out your answer.

.....

.....

.....

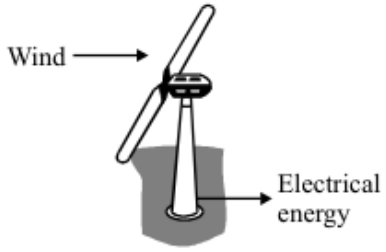
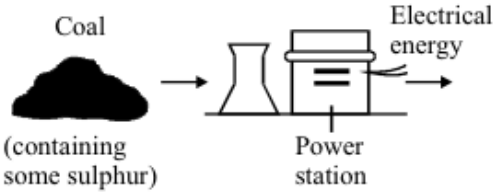
.....

Energy transferred = ... J

(2)
(Total 8 marks)

Q14. Electricity is a useful form of energy.

(a) Different energy sources can be used to generate electricity.

Wind is an energy source	**Coal, a fossil fuel, is an energy source**
	
This wind turbine generates 1 MW. (1 MW = 1000 kW)	This coal-fired power station generates 1000 MW.
Electricity demand in the UK can be 48 000 MW.	

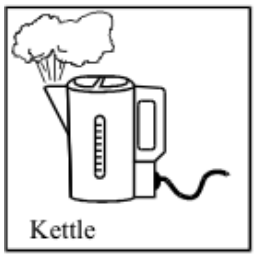
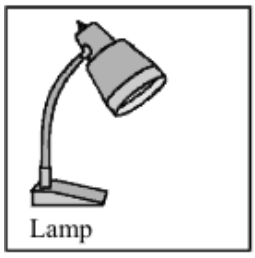
Give **one** advantage and **one** disadvantage (other than cost) of using each energy source to generate electricity in the UK.

Advantage	**Disadvantage**
Using wind	Using wind ....
Using coal	Using coal ....

(4)

(b) List **A** shows three electrical devices.
List **B** gives the type of useful energy transferred.

Draw a straight line from each electrical device in List **A** to the useful energy it transfers in List **B.**

List A	**List B**
Electrical device	**Useful energy transferred**
 Kettle	heat
 Radio	light
 Lamp	sound

(2)
(Total 6 marks)

Q15. There are many forms of energy. Some of these forms of energy can be "stored" ready to be used when the energy is needed. The chemical energy in fuels is one example of stored energy.

(a) Complete the following sentences by adding the missing words.

The chemical energy in fuels such as coal came originally from the ..... .

Energy from fuels can be used to ..... .

(2)

(b) An electric milk float has its batteries charged up overnight. Early in the morning the milkman sets off on his round. Describe the energy transfers which take place in the milk float as the milkman does his rounds.

.....

.....

.....

.....

.....

.....

(4)

(c) Give another example of energy other than fuels which can be classed as “stored” energy. Give a use of the “stored” energy.

Type of “stored” energy .....

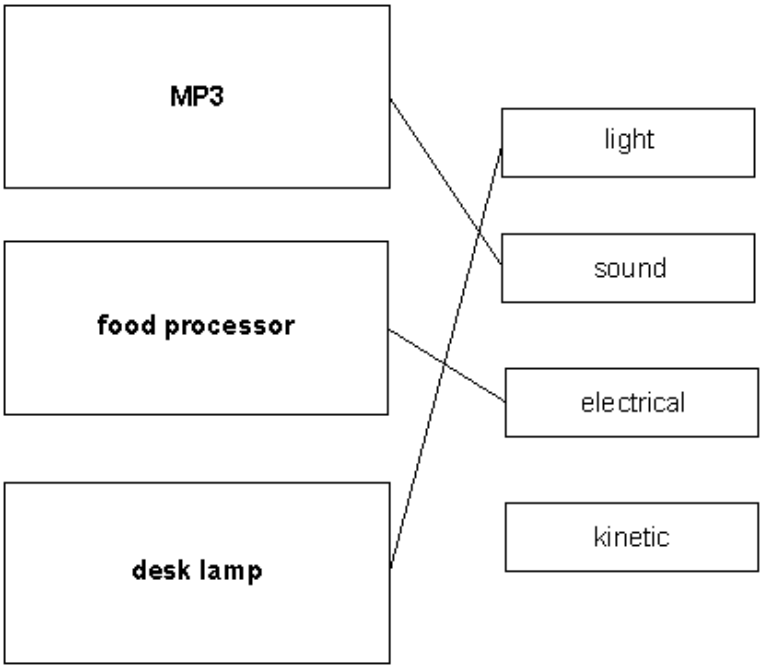
Use .....

.....

(2)

(Total 8 marks)

M1. 3 lines correct



*allow **1** mark for each correct line*
more than 1 line drawn from any appliance and all those lines are incorrect

[3]

M2. (a) electrical

1

sound

correct order only

1

(b) the energy transformed by the TV will be destroyed

1

(c) a higher efficiency than

1

[4]

M3. (a) (i) 0.6

accept 60 %
*allow **1** mark for useful energy = 480*
*answer 0.6 with any unit or 60 gains **1** mark only*

2

(ii) transferred to surroundings

accept goes into the air
accept heats the surroundings up
accept gets spread out
accept transferred into heat (only)

*do **not** accept wasted / lost unless qualified*
destroyed negates mark
transferred into light / sound negates mark

1

(b) (i) 1.75

*allow **1** mark for converting to kW*

*answers of 0.7, 0.525, 0.35, 0.875, 1.05, 5.25 gains **1** mark*
*answers of 1750 or 17.5 gains **1** mark*

2

(ii) 21p or £0.21 or their (b)(i) × 12

1

(c) any **two** from:

- (more) electricity needs to be generated

  (more) electricity is being used

- (more) power stations needed

- (more) fossil fuels burnt

  accept named fossil fuel

- (more) pollutant gases emitted

  accept named gas
  accept harmful for pollutant
  accept greenhouse gases
  accept atmospheric pollution

  accept answer in terms of any form of electricity generation and an associated environmental problem

2

[8]

M4. (a) kinetic

accept movement

1

(b) (i) 3 (kWh)

allow 1 mark for selecting the correct information

1

(ii) transfers more energy

accept transform or use for transfer

accept electricity for energy

*allow higher (average) power **and** switched on for more time*

2

(iii) any **one** from:

- use the internet
- brochures
- reading adverts
- visiting shops
- recommendation from friends / plumbers

1

[5]

M5. (a) (i) TV

1

(ii) hairdryer and sandwich toaster

both required either order but no others

1

(b) (i) 1.2

*allow **1** mark for correct substitution*

ie 0.4 × 3 provided that no subsequent step is shown

2

(ii) 18

accept £0.18 for both marks

or

their (b)(i) × 15 correctly calculated

*an answer 0.18 scores **1** mark*

*allow **1** mark for correct substitution*

ie 1.2 or their (b)(i) × 15 provided that no subsequent step is shown

2

(c) (i) precise

accept any correct indication

1

(ii) any **two** from:

- less electricity needs to be generated
- less fuels needed
  accept a named fuel used in any type of power station
- less air / atmospheric pollution
  accept named pollutant eg CO_2
  accept reduces carbon / carbon dioxide emissions
  accept reduces radioactive waste
- (non-renewable) energy sources last longer
  accept running out of fossil fuels / a named fossil fuel
- slows global warming / greenhouse effect
  *do **not** accept stops global warming*
  environmentally friendly is insufficient
  less pollution is insufficient

2

[9]

M6. (a) 1.8 (p)

*these **4** marks can be broken down as follows:*
***1** mark for correct transformation and substitution into efficiency equation*
ie 0.8 × 1200 – useful power
PLUS
***1** mark for useful power = 960 W / 0.96 kW*
PLUS
***1** mark for waste energy transferred = 0.24 × 0.5*
or
waste energy transferred = 0.12 (kWh)
PLUS
***1** mark for cost = 0.12 × 15*
where a mathematical error has been made full credit should be given for subsequent correct method

4

(b) the waste energy is transferred as heat and sound

1

to the surroundings where it spreads out / is shared by surrounding particles
accept air for surroundings

1

[6]

M7. (a) (i) electrons

1

(ii) ammeter

*do **not** accept ampmeter*

1

***must** be capital A*
horizontal lines not required no e.c.f.

1

(b) light bulb

answers in either order

1

hairdryer

1

(c) 0.6

*accept correct substitution for (0.2 × 3) **1** mark*
*accept 600 watt hours for **1** mark*

2

[7]

M8. (a) (i) kinetic

*do **not** accept movement*

1

(ii) thermal

accept heat for thermal

sound

*do **not** accept noise for sound*
both answers required in either order

1

(b) transferred to surroundings / surrounding molecules / atmosphere

'it escapes' is insufficient

or

becomes dissipated / spread out

accept warms the surroundings
accept degraded / diluted
accept a correct description for surroundings eg to the washing machine
*do **not** accept transformed into heat on its own*

1

(c) a smaller <u>proportion / percentage</u> of the energy supplied is wasted

owtte

*accept a statement such as 'less energy is wasted' for **1** mark*

*do **not** accept costs less to run*

ignore references to uses less energy

2

(d) (i) 2.4 (p)

accept 2 p if it is clear from the working out this is rounded from 2.4 p

*allow **1** mark for correct substitution of correct values*

ie 0.2 × 12

*allow **1** mark for calculating cost at 40 °C (13.2 p)*

or

cost at 30 °C (10.8 p)

2

(ii) any **one** from:

- less electricity needed

  ignore answers in terms of the washing machine releasing less energy

  an answer in terms of the washing machine releasing CO_2 negates the mark

  *do **not** accept less energy is produced*

- fewer power stations needed

- less fuel is <u>burned</u>

  accept a correctly named fuel

  *do **not** accept less fuel is needed*

1

[8]

M9. (a) £16.50

*allow **1** mark for correct substitution ie 110 × 15*

*an answer of 1650 gains **both** marks*

*an answer of 43.80 gains **both** marks*

*allow **1** mark for 292 × 15*

2

(b) 292

*allow **1** mark for correctly using the reading 53490*
ie 53782 – 53490

accept £43.80 for both marks

2

[4]

M10. (a) (i) kinetic

*do **not** accept movement*

1

(ii) thermal sound

accept heat for thermal
*do **not** accept noise for sound*
***both** answers required in either order*

1

(b) transferred to surroundings / surrounding molecules / atmosphere

'it escapes' is insufficient

or
becomes dissipated / spread out

accept warms the surroundings
accept degraded / diluted
accept a correct description for surroundings eg to the washing machine
*do **not** accept transformed into heat on its own*

1

(c) (i) 3 (.0 p)

*allow **1** mark for correct substitution of correct values ie 0.2 x 15*
*allow **1** mark for calculating cost at 40°C (16.5p)*
or
cost at 30°C (13.5p)

2

(ii) any **two** from:

- less electricity needed

  ignore answers in terms of the washing machine releasing less energy
  an answer in terms of the washing machine releasing CO_2 negates mark
  *do **not** accept less energy is produced*

- fewer power stations needed

- less fuel is <u>burned</u>

  accept a correctly named fuel
  *do **not** accept less fuel is needed*

2

[7]

M11. (a) (i) any **one** from:

water to the mug
water to the air
mug to the air
mug to the table

***both** required*
direction of transfer must be correct

1

(ii) when temperatures are the same

accept a specific example eg when the temperature of the water and mug are the same

accept radiant heat transfer will never stop

1

(b) wood

1

(c) (i) conduction

accept convection if not given as 3rd answer

1

insulator

1

convection

1

(ii) any **one** from:

*do **not** accept any rebuilding of house*

double glazing

loft insulation

accept roof for loft

1

carpets

(cavity) wall insulation

*do **not** accept closing doors and windows*

draft excluders

foil behind radiators

accept blocking chimney

paint inside walls white

[7]

M12. (a) 45(p)

accept £0.45 for both marks

*allow **1** mark for correct substitution ie 3 × 15*

*do **not** award any marks if 45 is used in a subsequent calculation to obtain a final answer*

2

(b) straight line drawn from origin passing through (1,1)

line must reach 1,1 but does not need to continue beyond

1

[3]

M13. (a) (i) conduction

1

convection

1

correct order only

(ii) to keep the ceramic bricks hot for a longer time

1

(b) (i) $E = P \times t$

18.2

*allow **1** mark for correct substitution ie 2.6 × 7 provided that no subsequent step is shown*

2

(ii) 91 (p)
or their (b)(i) × 5 correctly calculated

accept £0.91

*do **not** accept 0.91 without £ sign*

1

(c) $E = m \times c \times \theta$

2 250 000

*allow **1** mark for correct substitution ie 120 × 750 × 25 provided that no subsequent step is shown*

answers 2250 kJ or 2.25 MJ gain both marks

2

[8]

M14. (a) **Using wind (advantage)**

any **one** from

can be used in remote locations

renewable

clean

accept does not cause pollution to the air / land

1

Using wind (disadvantage)

any **one** from

does not generate much (electrical) energy
many hundreds wind turbines would be needed

*accept many hundreds wind turbines would be needed **or** too much land would be needed for wind farms **or** wind energy is 'dilute'*

the wind is unreliable

*accept the wind does not blow all of the time **or** the wind is not always strong enough*

noise / visual pollution

*do **not** accept just the word pollution*

1

Using coal (advantage)

any **one** from

can generate electricity all of the time

accept reliable electrical / energy supply

generates a lot of (electrical) energy

1

Using coal (disadvantage)

any **one** from

pollution by carbon dioxide / greenhouse gas

*accept slow start-up time **or** production of ash **or** difficult to transport (coal) **or** there's not much coal left*

non renewable

pollution by sulphur dioxide acid rain

1

(b) all link lines correct

accept one link line correct for one mark

2

[6]

M15. (a) Sun
Any valid

for 1 mark each

2

(b) From electric/pe or chemical in battery

for 1 mark

to ke, light, sound, heat

3 for 1 mark each

4

(c) Gravitational pe OR just pe
For any gravity feed
OR Elastic pe
any valid
OR Food
For maintaining body/life etc.
OR Any descriptive answer
e.g. water in a high lake used to produce hydroelectric power

2 for 1 mark each

2

[8]