

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Mark Schemes

Q1.

- (a) 32,400,00 J
allow 1 mark for correct substitution
 $3.24 \times 10^7 \text{ J}$
2
- (b) (3kW) fan heater
accept 3kW
accept the middle one
1
- (c)
features common to more than one heater, treat as neutral
oil-filled
low level heat
cannot be knocked over / space saving / no trailing wires
do not accept just wall-mounted
or more control over heat output
do not accept just 3 heat settings
1
fan
warms (office) rapidly **or** can be used to cool air (in summer)
accept can be used as a fan
accept cool air fan (setting)
accept 'it has a cool air setting in case it gets too hot'
do not accept a specific reference to cooling the heater
1
ceramic
can be switched on for set periods of time
do not accept just has a timer
or can be switched on before office is used / switched off automatically at night
1

[6]

Q2.

(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) $\times 12$

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]

Q3.

(a) (i) small proportion of energy / power is wasted

*accept little / less energy / power / heat is wasted
do **not** accept it wastes no energy / power*

or transfers most / more / a lot of energy power usefully

1

(ii) it decreases the current / uses low current

or it increases the voltage / potential difference

accept pd for potential difference

1

or uses high voltage / potential difference

smaller the current the smaller the energy loss

accept power / heat for energy

1

(b) (i) as a control

accept to make a comparison

*do **not** accept fair test on its own*

1

(ii) so people know how much data the link was based on

accept idea that larger numbers are better

or

people can judge the significance / reliability of the link

*do **not** accept significance / reliability on its own*

ignore reference to accuracy

1

(iii) other possible factors may be responsible

1

or have not been investigated

named factor eg environment / genetic

1

(iv) first box ticked plus reason

acceptable reason such as so people know there may be a risk as soon as possible / so that other scientists can use findings

or second box plus reason

acceptable reason such as no point to worry / confuse / panic people (until the research has been confirmed)

accept idea that it may lead to wrong advice

*do **not** accept in case they are wrong*

1

[8]