

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Mark Schemes

Q1.

- (i) *this mark only scores if a correct pair is chosen **and** a correct reason given*

A and C

both required and none other

or

B and D

both required and none other

only one (independent) variable

or

different shapes but the same colour

accept only the shape changes

1

- (ii) **B radiates** heat faster
converse answer in terms of A gains full marks

1

or

B is a better emitter (of heat)

but B has a smaller (surface) area

or

B has a smaller (surface) area: volume ratio

allow 2 marks for both lose the same quantity / amount of heat in the same time

or both have same rate of heat loss

allow 1 mark for both lose the same quantity / amount of heat

1

- (iii) any **one** from:

- transfer a lot of heat (too rapidly)
- water temperature drops too rapidly
accept (significantly) more heat will be lost from the first radiator
- water too cold for the next radiator
mention of absorption of heat negates mark

1

[4]

Q2.

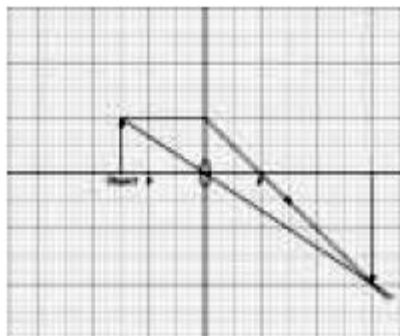
- (a) any **two** for **1** mark each

deduct (1) from the first two marks if a ruler has not been used but the intention is clear

ray from the object's arrowhead

- through centre of lens
- parallel to the axis then, when it reaches the lens, through F on the right
- through F on the left then, when it reaches the lens parallel to the axis

example of a 4 mark response



if more than two construction lines have been drawn all must be correct to gain 2 marks

construction lines drawn as dashed lines do not score credit

2

image shown as vertical line from axis to where their rays intersect

image need not be marked with an arrowhead but, if it is, it must be correct

1

ray direction shown

only one correct direction

arrow needed but there must not be any contradiction

1

- (b) any **two** from:

- inverted
accept 'upside down'
- magnified
accept 'bigger'
- real
accept 'not virtual / not imaginary'
one correct feature gains 1 mark
ignore any reference to position
an incorrect feature negates a correct response

2

[6]

Q3.

- (a) (i) any **two** from:
- travel at the same speed (through a vacuum)
accept travel at the speed of light
accept air for vacuum
 - can travel through a vacuum / space
*do **not** accept air for vacuum*
 - transfer energy
 - can be reflected
 - can be refracted
 - can be diffracted
 - can be absorbed
 - can be transmitted
 - transverse
accept any other property common to electromagnetic waves
accept travel at the same speed through a vacuum for both marks
*do **not** accept both radiated from the Sun*
- 2
- (ii) infra red
- 1
- both** required for the mark
- radio(waves)
- accept IR for infra red*
- 1
- (b) 2 400 000 000
- correct transformation and substitution gains 1 mark*
- ie $\frac{300000000}{0.125}$ or $\frac{300000000}{0.125}$
- an answer of 24 000 000 gains 1 mark*
- either** 2 400 000 kHz
- or** 2 400 MHz scores **3** marks but the symbol only scores the 3rd mark if it is correct in every detail
- 2
- hertz
- accept Hz*
*do **not** accept hz*
- 1
- (c) (i) presented (scientific) evidence / data
- do an experiment / investigation is insufficient*
- 1
- (ii) to find out if there is a hazard (or not)
- accept to find out if it is safe*
accept not enough evidence to make a decision
not enough evidence is insufficient
- 1