

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

- | | | | |
|------|--|---|------------|
| (i) | absorbed by water / water heated | 1 | |
| | hot water heats (rest of) food / idea of particle vibration | 1 | |
| (ii) | $300\,000\,000 / 3 \times 10^8$
<i>correct answer with no working = 2</i>
<i>allow 1 mark for $s = f \times w$ or correct working i.e., $10000\,000000 \times 0.03$</i>
<i>N.B. correct answer from incorrectly recalled relationship / substitution = 0</i> | 2 | [4] |

Q2.

- | | | | |
|-----|----------|---|------------|
| (a) | D | 1 | |
| (b) | C | 1 | |
| (c) | B | 1 | [3] |

Q3.

- | | | |
|-----|--|---|
| (a) | amplitude marked as approximately half a wave height
<i>great precision is not required</i> | 1 |
| | wavelength marked as a trough to trough distance or a peak to peak distance
<i>accept an equivalent repeat distance anywhere on the wave</i> | 1 |
| (b) | the number of waves each second
<i>accept cycles per second accept 25 waves pass each second</i> | 1 |
| (c) | any pair from
microwave cooking or communication or mobile phone | |

radio communication **or** entertainment

infra-red cooking **or** heating **or** remote control **or** security **or** night sights **or** thermal imaging

accept sensible specific uses

2

[5]

Q4.

idea that X-rays cause mutations

gains 1 mark

but X-rays can cause/increase chance of mutations

gains 2 marks

mutations usually harmful/produce abnormal growth
serious effect on growing foetus/rapidly growing cells

each for 1 mark

[4]

Q5.

(a) gamma rays above x-rays

for 1 mark

(b) upper radio wave boundary correct (10^{-1}m) ($\pm 1\text{mm}$)

for 1 mark

(c) visible radiation/light

- within the middle third of a wavelength band
- in the correct wavelength range ($10^{-6} - 10^{-7}\text{m}$)

each for 1 mark

(d) ultraviolet between *visible radiation and X-rays

for 1 mark

(e) microwaves above *radio waves and below *infra red
(*not necessarily immediately)

for 1 mark

(f) between 10^8Hz + 10^7Hz and nearer to 10^8Hz than to 10^7Hz

gains 1 mark

[7]