

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Mark Schemes

Q1.

- (a) (i) radio(waves) 1
- (ii) energy
correct answer only 1
- (b) (i) 0.0125 (m)
allow 1 mark for correct transformation and substitution 2
- (ii) make it hot(ter)
*do **not** accept cook it*
accept (air) particles inside ball will move faster
accept water in the ball gets hotter 1

[5]**Q2.**

- (i) all electromagnetic waves travel at the same speed through a vacuum, (so assume same speed in air)
accept 'all parts of spectrum' for electromagnetic waves 1
- (ii) 1500 (m)
allow 1 mark for correct transformation and substitution
allow 1 mark for using 200 000 Hz
answers 1 500 000 = 1 mark 2
- (iii) line drawn at correct position
anywhere between 1000 and next section (10 000)
accept their value for (a)(ii) drawn in the correct position 1

[4]**Q3.**

- (a) C or 0.18 mm 1

- (b) 0.6 m
allow 1 mark for correct transformation and substitution
allow 1 mark for changing frequency to Hz
answer 600 gains 1 mark
 2
- (c) creates an alternating current
accept 'ac' for alternating current
accept alternating voltage
 1
- with the same frequency as the radio wave
accept signal for radio wave
- or** it gets hotter
 1
- (d) X-rays cannot penetrate the atmosphere
accept atmosphere stops X-rays
*do **not** accept atmosphere in the way*
- or** X-rays are absorbed (by the atmosphere)
before reaching Earth
ignore explanations
 1

[6]

Q4.

- (a) 400 000 000
or
 correct equivalent
*allow 1 mark for correct transformation **and** substitution (of 75)*
answer 4 000 000 gains 1 mark only
 2
- (b) (i)
any mention of alpha, beta, gamma waves scores 0 marks
- emit / uses / transmit / receive microwaves
accept radiation for microwaves throughout
ignore radio waves
 1
- some microwave / energy absorbed by / enters the body
ecf for their given electromagnetic wave
*do **not** accept goes through the body*
 1
- raises temperature of (body) cells / tissue / water
accept reference to water molecules vibrating faster
accept it could cause mutation / harm / kill cells
*do **not** accept answers in terms of ionisation*
ignore references to cancer
 1

(ii) any **two** from:

- research (may be) biased
or may have been misled in the past
accept not independent
or *may be lying*
- some research suggests a link
- long-term effect not proven / studied
accept not studied for long enough
- residents may not have seen the research

2

[7]