

# Electromagnetic Waves 1 MS

## QUESTION 1

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	B		1
b)	G		1
c)	D		1
d)	A		1
Total marks			4

## QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)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
a)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
a)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
b)	any two from: ☒ energy not usefully transformed is wasted e.g. not listened to ☒ (wasted and useful) energy transferred to surroundings ☒ (energy spreads out) and is difficult to use usefully for further energy transformations	accept specific examples of energy wasted by any named appliances  do not accept machines not 100 % efficient on its own	2
Total marks			6

### QUESTION 3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	X-rays infra red (rays) radio (waves)	all three in correct order  allow 1 mark for 1 correct	2
a)ii)	to kill cancer cells		1
a)iii)	energy		1
Total marks			4

### QUESTION 4

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	radio(waves)		1
a)ii)	energy	correct answer only	1
b)i)	0.0125 (m)	allow 1 mark for correct transformation and substitution	2
b)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
b)iii)	wavelength decreases frequency increases	ignore reference to speed	1
Total marks			7

### Question 5

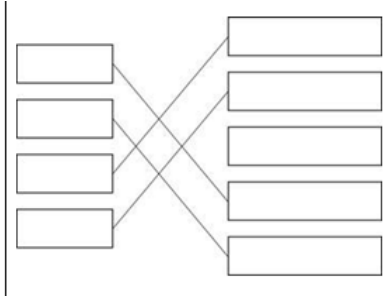
QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	<p>all three lines correct</p>	allow 1 mark for each correct line if more than one line goes from a device then all lines from that device are wrong	3
b)i)	skin cancer	do not accept cancer do not accept sunburn	1

		correct answer only	
b)ii)	other factors may be involved	accept may have been in the Sun too long accept (over)-use of sunbeds and (over)-exposure to the Sun (both) give the same symptoms accept any other sensible factor that could lead to doubt do not accept irrelevant answers eg may be run over by a car do not accept large numbers killed by exposure to the Sun	1
b)iii)	can assess risk or make your own decision	answers should be in terms of assessing your own health risk accept so you limit its use /  don't use one do not accept so you don't get skin cancer do not accept so you don't get sunburn	1
Total marks			6

### QUESTION 6

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	X-ray(s)		1
a)ii)	gamma rays		1
a)iii)	infrared		1
b)	the same speed as		1
Total marks			4

**QUESTION 7**

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	all 4 lines correct  	allow 1 mark for each correct line  if 2 or more lines are drawn from any box in List A then all those lines are incorrect	4
b)i)	The distance between the UV lamp and the bacteria.		1
b)ii)	longer the exposure / time smaller % living		1
b)iii)	only 1 type of bacteria tested or not tested all types of bacteria	accept some bacteria not affected by UV only one set of data / results is insufficient did not repeat experiment is insufficient not enough evidence to support conclusion is insufficient	1
Total marks			7