

Name of the Student: \_\_\_\_\_

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

**Q1.**

- (i) wave speed = frequency
- $\times$
- wavelength

*accept correct transformation**accept  $v = f \times \lambda$* *accept s for speed**accept  $m/s = Hz \times m$* 
*accept*  *if subsequent use of*  *is correct*

1

- (ii) 500 000 000

*credit for 1 mark correct transformation in words **or** numbers **or** correct substitution*

2

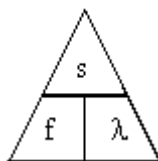
Hertz

*3 marks for 500 000k Hz **or** 500 MHz**numerical answer **and** unit must be consistent for full credit*

1

**[4]****Q2.**

- (i) speed = frequency
- $\times$
- wavelength

*accept the equation rearranged**accept  $v$  **or**  $s = f \times \lambda$* *do not allow w for wavelength**do not accept**unless subsequent calculation correct*

1

- (ii) 330 (m)

*allow 1 mark for*

$$\lambda = \frac{300\,000\,000}{909\,000}$$

***or**  $300\,000\,000 = 909\,000 \times \lambda$*

**Q3.**

(i) 0.5

1

(ii) wave speed = frequency  $\times$  wavelength

accept  $v = f \times \lambda$

accept  $s$  for  $v$

accept  $m/s = Hz \times m$

accept



providing subsequent method correct

1

(iii) 15.2 km

both numerical answer and unit are required for both marks

numerical answer and unit must be consistent

allow **1** mark for 15.2 with incorrect or no unit

allow **2** marks for an answer of 1.52 km if the answer to (b)(i) was given as 5

**r** 1 mark for correct transformation

**or** 1 mark for correct use of speed = distance/time

unit on its own gains no credit

2

**Q4.**

(a) radio – 1500  
ultra violet  $3 \times 10^{-8}$   
visible –  $5 \times 10^{-7}$   
X-rays –  $1 \times 10^{-11}$

4

(b)  $1 \times 10^{10}Hz$   $10^{10}Hz$ OK  
for 4 marks

else  $1 \times 10^{10}$   
for 3 marks

else  $3 \times 10^8/0.03$   
for 2 marks

else  $v = \text{frequency} \times \text{wavelength}$  or  $3 \times 10^8 = 0.03f$   
any answer with unit Hz scores 1, 2 or 3  
for 1 mark

4