Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : Waves

Name of the Student:_____
Max. Marks : 27 Marks **Time : 27 Minutes**

Mark Schemes

Q1.

Question	Answer	Additional guidance	Mark
	An explanation linking more absorption giving less reflection of sound (coefficient of) absorption / α is greater (for carpets / curtains than walls / wood floors) or more of the incident energy/sound is absorbed (1)	ignore references to insulation	**2** **AO3.1**
	(therefore) less of the incident energy /sound is reflected (back into the room) or wooden floors and painted walls reflect sound (1)	accept echo/bounces around (the room) for reflection	

Q2.

	Answer	Additional guidance	Mark
	an explanation linking: (refraction caused by) change in speed (1) sound speeds up (when entering water) (1) light slows down (when entering water) (1)	allow 3 marks for sound speeds up and light slows down (when entering water) allow 2 marks for sound speeds up (when entering water) OR light slows down (when entering water) if no other marks scored allow 1 mark for description of any speed change (when entering water) if no other marks scored allow 1 mark for wavelength changes ignore references to transverse, longitudinal.	**(3)** **AO1**

Q3.

Question number	Answer	Additional guidance	Mark
(i) CS1	a description to include count the number of waves(1) (arriving/passing a point) in a specific time(1) use frequency = $\frac{\text{number of waves}}{\text{time}}$ (1)	 ignore in one second count the number of waves in one second scores 2 marks (MP1 and MP3) find the time between one wave and the next scores 2 marks (MP1 and MP2)	(3) AO1

Question number	Answer	Additional guidance	Mark
(ii) CS1	substitution (1) $1.5 = 0.7 \times \lambda$ rearrangement and evaluation 2.1(4) m	 $\frac{1.5}{0.7}$ allow $\frac{0.7}{1.5}$ for 1 mark award full marks for correct answer without working. $\lambda = v/f$ scores 1 mark	(2) AO2

Question number	Answer	Additional guidance	Mark
(iii) CS1	A description to include: mention of oscillations/vibrations (1) EITHER transverse – (oscillations) perpendicular to direction of wave (travel) (1) OR longitudinal - (oscillations) in same direction as wave (travel) (1)	up and down OR side to side (movements) OR back and forth transverse movement up and down but longitudinal is side to side (1 mark only)	(2) AO1

Q4.

Question Number	Answer	Additional guidance	Mark
	substitution (1) $\frac{3.0 (\times 10^{8})}{5.8 (\times 10^{-7})}$ evaluation (1) 5.2×10^{14}	 answers that round to 5.2×10^{14} award 2 marks for a correct answer without working allow 1 mark for answers that round to 5.2 to any power of ten	**(3)** AO 2 1
	unit (1) Hz	independent mark accept hz or s^{-1} or per sec(ond) or hertz accept kHz, MHz etc with correct power (10^{11} kHz, 10^{8} MHz)	

Q5.

Question Number	Answer	Acceptable answers	Mark
(a)	An explanation linking any two of: MP1 magnify (1) with one of: MP2 the (real) image from objective (lens) (1) MP3 to provide greater detail (1)	 enlarges / bigger ignore zooming the real image (in the telescope) / image at focal point ignore make it clearer inversion of image focuses image	**(2)**

Question Number	Answer	Acceptable answers	Mark
(b)	One sensible suggestion, such as • made recording results {easier /quicker} (1) • results more convincing to other people (1) • photograph is to scale (1)	For example, don't have to keep looking through telescope would be (better) proof / evidence (i.e. between geo- and helio-centric models) (eg multiple photographs would prove movement/orbit of moons) (photograph) is more {accurate / precise / reliable}/ can measure (relative) separations of moons (from planet) better ignore more detail/clearer/zooming	**(1)**

Question Number	Answer	Acceptable answers	Mark
(c)	Substitution (1) $3.0 \times 10^{8} = 4.3 \times 10^{14} \times \lambda$ Transposition (1) $(\lambda=) \quad \frac{3.0 \times 10^{8}}{4.3 \times 10^{14}}$ Evaluation (1) 6.98×10^{-7} (m)	 Substitution and transposition in either order Ignore triangle correct answer no working = 3 power of ten error = 2 to at least 2sf (eg 7.0/6.97.....)x10^{-7} Ignore powers of 10 until evaluation	**(3)**

Question Number		Indicative content	Mark
QWC	*** (d)**	A description to include some of the following points description of models • geocentric • heliocentric description of one set of observations of Jupiter's moons explanation of how observation contradicts geocentric but does not prove the other NB beware that you do not reward repetitions of the question stem	**(6)**
Level	**0**	no rewardable material	
1	**1-2**	• a limited explanation of the geocentric **AND** the heliocentric model such as *geocentric model said everything orbited the Earth while the other was for everything going round the Sun.* **OR** clearly explains the one model and describes Galileo's observations *eg geocentric model said everything orbited the Earth but Galileo observed that Jupiter had moons going around it* • the answer communicates ideas using simple language and uses limited scientific terminology e.g. allow confusion between geocentric and heliocentric • spelling, punctuation and grammar are used with limited accuracy	
2	**3-4**	• a simple explanation of geocentric **AND** heliocentric models **AND** Galileo's observations of Jupiter's moons/explains heliocentric not proved e.g. *The geocentric model said everything orbited the Earth while the heliocentric was for everything orbiting the Sun. Galileo observed that Jupiter had moons orbiting around it.* • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately e.g. correct use geocentric and heliocentric • spelling, punctuation and grammar are used with some accuracy	
3	**5-6**	• a detailed explanation of geocentric **AND** heliocentric models **AND** the role of Galileo in providing evidence against the geocentric **BUT** not enough for the heliocentric such as *The geocentric model said everything orbited the Earth while the heliocentric was for everything orbiting the Sun. Galileo's observations that Jupiter had moons orbiting arou(nd it showed that the geocentric model was wrong **but not** that Jupiter or anything else went around the Sun.* • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately e.g. distinguishes between the necessary and insufficient conditions • spelling, punctuation and grammar are used with few errors	