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

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

Question number	Indicative content	Mark
	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO1 3 marks AO3 Strand1 3marks When there is an Earthquake **At A** • Longitudinal and transverse waves detected • P arrive before S. • must be travelling in a solid because S waves only travel through solids • the region just under the Earth's crust (mantle) must be a solid • the diagram show the waves refracting so the mantle must be getting more dense as it gets deeper **At B** • No S waves or P waves detected • S waves do not pass through liquid so do not get to B • P waves pass through liquid but are refracted at a solid/ liquid boundary so do not arrive at B • The core of the Earth must be liquid to stop both P and S waves arriving at B **At C** • No S waves arrive at C • P waves arrive at C at different times because the waves have travelled at different speeds. • This suggests the very centre of the Earth would be solid because the P waves that go through the solid would travel faster and arrive before those that just travelled through liquid	**(6)** **AO1** **AO3**

Downloaded from www.merit-minds.com

Level	Mark	Descriptor
	0	No rewardable material.
Level 1	1–2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Interpretation and evaluation of the information attempted but will be limited with a focus on mainly just one variable. Demonstrates limited synthesis of understanding. (AO3)
Level 2	3–4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Interpretation and evaluation of the information on both variables, synthesising mostly relevant understanding. (AO3)
Level 3	5–6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Interpretation and evaluation of the information, demonstrating throughout the skills of synthesising relevant understanding. (AO3)

Downloaded from www.merit-minds.com

Level	Mark	Additional Guidance	General additional guidance – the decisions within levels
	0	No rewardable material	
Level 1	1-2	Additional guidance Elements of physics present i. e. isolated knowledge of principles, **two** unconnected statements from any section	Possible candidate responses core is liquid/ mantle (crust) is solid waves refract P waves change direction S and P waves travel through mantle(crust) at A, S and P waves detected at B, no waves detected at C, only P waves detected S waves are transverse P waves are longitudinal
Level 2	3-4	Additional guidance Some knowledge of principles with a logical connection made in **ONE** section and a statement in **ONE** other Or From ONE section detailed knowledge of principles with logical connections	Possible candidate response at A, S and P waves are detected so must pass through solid at B no waves are detected, the waves change direction/ Region B is the shadow zone at C, P waves are detected because they go straight through the Earth/can travel through the core in Earth's core there are different densities/waves change direction
Level 3	5-6	Additional guidance Detailed knowledge of principles with logical connections made in **TWO** of the sections	Possible candidate response at A, S and P waves are detected so must pass through solid and refract/curve at B, no waves are detected because S waves do not pass through liquid core and P waves are refracted away by the liquid. At C, only P waves are detected because they can pass through the liquid core and change direction in the core(refracted) In the Earth's core there is refraction of waves/ inner and outer core have different densities

Downloaded from www.merit-minds.com

Q2.

Question number	Answer	Acceptable	Mark
(i)	An explanation that combines identification - understanding (1 mark) and reasoning/justification - understanding (2 marks): • white light is a mixture of different wavelengths (1) • each wavelength / colour is refracted by a different amount (1) • short <u>wavelengths</u> are refracted more / ORA (1)	ignore colours	(3)

Question number	Answer	Acceptable	Mark
(ii)	An answer that combines the following points to provide a logical description of the method: • Place a thermometer (with blackened bulb) beyond position of red light (1) • Look for rise in temperature (measured by thermometer) (1)		(2)

Downloaded from www.merit-minds.com

Q3.

Question number	Answer	Additional guidance	Mark
	explanation linking: wave P refracts (towards the normal) (1) because P slows down (1) AND wave Q is reflected (at an equal angle from the boundary) (1) without change of speed of Q (1)	accept 'upper layer' for 'P' accept 'wavelength decreases' accept 'bends' for 'refracts' in this instance accept 'lower layer' for 'Q' accept 'wavelength unchanged' accept 'wave Q bounces off' (at an equal angle) allow one mark for refraction and reflection if no other mark awarded	**(4)**

Downloaded from www.merit-minds.com

Q4.

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	

Downloaded from www.merit-minds.com