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

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 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** • ultrasound pulses used • ultrasound has frequency above 20 kHz • boat has device for producing pulses • ultrasound pulses emitted • ultrasound pulses travel through sea water • pulses reflected by/bounce off/echo off ocean bed • pulses reflected/travel back to boat • time between emission and receipt of pulse measured by device on the boat • velocity of sound in sea water known • use of v=d/t	**6** **AO1.2** A labelled diagram may give some information that is credit worthy

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	• speed of sound = distance/time • d=v x t • either distance halved or time halved prior to calculation of distance **accept 'sonar' for ultrasound**	

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) • Presents an explanation with some structure and coherence. (AO1)
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) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)

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Level	Mark	Additional Guidance	General additional guidance – the decision within levels e.g. - At each level, as well as content, the scientific coherency of what is stated will help place the answer at the top, or the bottom, of that level.
	0	No rewardable material.	
Level 1	1–2	Additional guidance isolated facts about measuring depth of ocean	Possible candidate responses sound emitted from boat sound goes through the sea sound bounces back / echoes time measured distance=velocity x time uses ultrasound (pulse)
Level 2	3–4	Additional guidance limited description of determination of depth of ocean	Possible candidate responses sound emitted from boat travels to ocean bed and is reflected and time taken from emission to receipt of wave is measured or distance=velocity x time
Level 3	5–6	Additional guidance detailed description of determination of depth of ocean	Possible candidate responses ultrasound pulse emitted from boat ultrasound pulse travels to ocean bed and is reflected time taken for emission to receipt of pulse is measured velocity of sound in sea water known distance travelled = velocity x time halve distance / halve time measured to calculate depth of ocean Any two from three of ultrasound, pulse, halving of distance or time
			required for Level 3.

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Q2.

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Level 3	5–6	Additional guidance detailed description of determination of depth of ocean	Possible candidate responses ultrasound pulse emitted from boat ultrasound pulse travels to ocean bed and is reflected time taken for emission to receipt of pulse is measured velocity of sound in sea water known distance travelled = velocity x time halve distance / halve time measured to calculate depth of ocean Any two from three of ultrasound, pulse, halving of distance or time
			required for Level 3.

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Q3.

Question number	Answer	Additional guidance	Mark
	An explanation linking any four from use of seismometers (1) waves can be refracted in the interior of the earth (1) (showing) different densities (1) some seismic waves are longitudinal and some transverse (1) S/transverse waves cannot pass through liquid (1) S wave / transverse wave shadow zone shows part of the earth must be liquid (1) P / longitudinal waves can go through the core/liquid (1) mention S and P waves (1)	S/transverse waves can only pass through solids	**(4)** **exp**

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Q4.

Question Number	Answer	Additional guidance	Mark
	An explanation linking: make the distance between students larger (1) OR viable alternative method such as use microphones / sound sensors / datalogger (to start and stop timer) (1) **with:** to give a more measurable time (1) OR to remove (variable) reaction times (at start and end) / to reduce effect of reaction times / improve accuracy of timing (1)	50 m is too short (a distance to produce a measurable time) gives a longer time – more accurate measurement do not accept 'more accurate' without qualification for either method	**(2)**

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