

Name of the Student: _____

Max. Marks : 9 Marks

Time : 9 Minutes

Mark Schemes

Q1.

Question Number	Indicative Content	Mark
QWC *	<p>An explanation including some of the following points</p> <ul style="list-style-type: none"> • Longitudinal {vibrations/oscillations} are {along/parallel to/in the same direction as} the direction of {travel/energy transfer} • Transverse {vibrations/oscillations} are {across/perpendicular to/90° to/right angles to} the direction of {travel/energy transfer} • Ultraviolet waves are transverse • Ultrasound waves are longitudinal (ignore sound – not on list) • Some seismic waves are longitudinal and some are transverse • P waves are longitudinal • S waves are transverse • Longitudinal waves need a material for the vibrations whereas electromagnetic waves can pass through a vacuum <p>IGNORE irrelevant material</p>	(6)

Level	0	No rewardable content
1	1 - 2	<ul style="list-style-type: none"> • a limited explanation of: EITHER the {vibration/movement} direction and direction of {travel/movement} for transverse or longitudinal wave OR correctly identifying the wave type for at least one example from the list, e.g. <ul style="list-style-type: none"> ○ Longitudinal waves move in the same direction as the wave moves ○ Ultraviolet waves are transverse • the answer communicates ideas using simple language and uses limited scientific terminology
2	3 - 4	<ul style="list-style-type: none"> • a simple explanation linking: EITHER directions of {vibration/oscillation} and wave travel for both types of wave OR direction of {vibration/oscillation} and wave travel of one type of wave with at least one example of a wave from the list OR the direction of 'movement' and direction of {travel/movement} for transverse AND longitudinal waves AND correctly identifying the wave type for at least one example from the list e.g. <ul style="list-style-type: none"> ○ In longitudinal waves the vibrations are in the same direction as the wave travels. In transverse waves the vibrations are at right angles to the direction the wave travels. ○ In longitudinal waves the vibrations are in the same direction as the wave travels. Ultraviolet waves are transverse. ○ Longitudinal waves move in the same direction as the wave moves. Transverse waves move at right angles to the direction the wave moves. Ultrasound waves are longitudinal. • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy
3	5 - 6	<ul style="list-style-type: none"> • a detailed explanation clearly differentiating between the directions of {vibration/oscillation} for longitudinal AND transverse waves AND at least one example of <u>each type of wave</u> from the list, e.g. <ul style="list-style-type: none"> ○ In longitudinal waves the vibrations are in the same direction as the wave travels. In transverse waves the vibrations are at right angles to the direction the wave travels. Ultrasound waves are longitudinal and ultraviolet waves are transverse. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors

Question Number	Answer	Acceptable answers	Mark
	<p>Substitution (1) (Speed =) $6.67 \times 10^{14} \times 4.5 \times 10^{-7}$</p> <p>Transposition AND substitution (1) (time =) $\frac{4 \times 10^{16}}{(6.67 \times 10^{14} \times 4.5 \times 10^{-7})}$</p> <p>Evaluation (1) 1.33×10^8 (s)</p>	<p>Award full marks for correct answer with no working</p> <p>3×10^8 (m/s) seen anywhere</p> <p>$\frac{4 \times 10^{16}}{3 \times 10^8}$</p> <p>ECF candidate's speed maximum 2 marks</p> <p>Allow answers which round to 130 000 000</p> <p>IGNORE Power of Ten error until evaluation</p>	(3)