

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Mark Schemes

Q1.

Question number	Answer	Additional guidance	Mark
	B A, C and D are incorrect because energy is transferred but air is not transferred		1 AO1.1

Q2.

Question Number	Answer	Mark
(i)	B the line shows the amplitude A is incorrect the line shows twice the amplitude C is incorrect the line shows half the wavelength D is incorrect the line shows the wavelength	(1) AO1

Question Number	Answer	Additional guidance	Mark
(ii)	an explanation linking vibration/oscillation (1) perpendicular / at right angles / 90° (to the direction of travel of the wave/direction of energy transfer) (1)	accept up and down	(2) AO1

Q3.

Question number	Answer	Additional guidance	Mark
	A amplitude B, C and D are incorrect because they are independent of intensity		1 AO1.1

Q4.

Question number	Answer	Additional guidance	Mark
	A 9cm B is incorrect because amplitude is measured from zero to the peak displacement C is incorrect because this is half the wavelength D is incorrect because this is the wavelength.		1 AO2.1

Q5.

Question Number	Answer	Additional guidance	Mark
	an explanation linking: • measure across more than one (wavelength) (1) • divide by the number of wavelengths (1)	use a more accurate device (finer divisions) use a camera / picture/strobe(light) (so the waves are not moving) count the number of wavelengths must be talking about measuring, NOT changing the wavelength etc.	(2) AO 3 3b

Q6.

	Answer	Acceptable answers	Mark
	relevant values 110 and 10 seen anywhere(1) 100 (s) (1) acceptable range 95 to 105 (s)	(could be on chart) tolerance +/- 5 s give full marks for correct answer, no working	(2)

Q7.

	Answer	Acceptable answers	Mark
(a)(i)	☒ A on the finger		(1)
(a)(ii)	infrared (1)	red light	(1)
(a)(iii)	89/60 (1) 1.5 (beats/second) (1)	1.48 (beats/second) Allow 1.49 1.483333etc Accept correct answer no working for 2 marks	(2)
(a)(iv)	1/1.5 (1) 0.67(s) (1)	ecf 1/ 89 one mark only Accept correct answer no working for 2 marks	(2)

		Indicative Content	Mark
QWC	*(b)	A description including some of the following points: what the information / signal is • electrical signals • small difference in potential (mV) between one part of the body and another • signal changes as the heart beats • are started in the heart (right atria) • caused by nervous impulse • action potentialssignal in • electrodes attached to the skin • water in the body conducts electricity / signal • at least two electrodes used • electrodes conduct electricity / contain gelsignal out • shows heart rate on a screen / paper • shows a waveform on a	(6)

		screen / paper • receives small signals which have to be amplified	
Level	0	No rewardable content	
1	1 - 2	• a limited explanation e.g. it shows your heart beat on a screen • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	3 - 4	• a simple explanation e.g. it shows if your heart is working properly by measuring heart beat which you can see on a screen • 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	• a detailed explanation e.g. connects electrodes/wires on the skin to measure (electrical) signals of the heart in order to assess the heart beat/heart performance/heart condition • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	