

Name of the Student: _____

Max. Marks : 17 Marks

Time : 17 Minutes

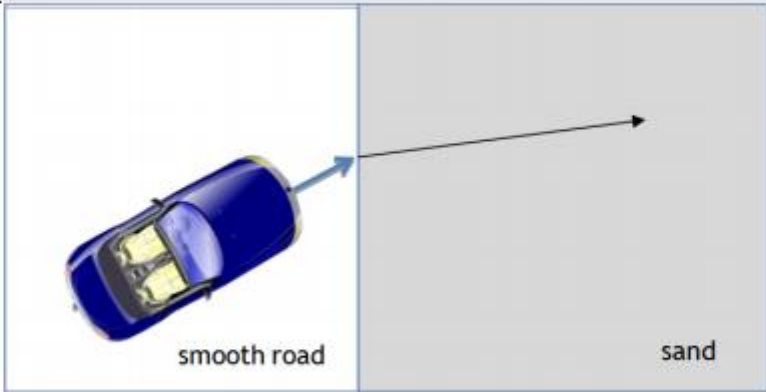
Mark Schemes

Q1.

Question Number	Answer	Mark
	B 20k Hz to 20 Hz <i>A is not correct because 2Hz is an infrasound frequency</i> <i>C is not correct because 2000kHz is an ultrasound frequency</i> <i>D is not correct because 200kHz is an ultrasound frequency</i>	(1) AO1

	Answer	Additional guidance	Mark
(ii)	An explanation linking any two of :- the size of the parts of the (inner) ear (1) vibrations at (limited) range of frequencies/range of sounds most common as adapted through evolution (1) (membrane) variations in stiffness/width/thickness (1) different parts vibrate at different frequencies (1) eardrum not sensitive enough to detect low/high frequencies (1) brain cannot interpret low/high frequencies (1)	allow length of cochlea allow cochlea allow ultrasound / infrasound allow ultrasound / infrasound	(2) AO2

Q2.

Question number	Answer	Mark
(i)	 smooth road sand approx	(1)

Question number	Answer	Additional guidance	Mark
(ii)	An explanation that combines identification - knowledge (1 mark) and reasoning/justification - understanding (1 mark): - both car and light ray slow down when entering sand / glass (1) - direction changes towards normal (1)	Bend towards the normal	(2)

Q3.

Question Number	Answer	Additional guidance	Mark
	single straight line in upper right quadrant (1) direction change towards the normal (1)	ignore arrow direction conditional on first mark point	(2)

Q4.

Question Number	Answer	Additional guidance	Mark
	An answer that combines the following points of understanding to provide a logical description: • (dolphin emits and) receives sound reflected from the objects (1) • (dolphin determines) difference in times taken to receive the echo (1) • sound received in a shorter time from nearer object (1)	may be inferred from a diagram	(3)

Q5.

Question Number	Answer	Additional guidance	Mark
	A description including <u>particles</u> (at end) vibrate (more) (about fixed positions) (1) cause neighbouring particles to vibrate (more) (1)	allow atoms / ions / molecules for particles vibrations passed along OR reference to longitudinal waves / compressions and rarefactions	(2)

Q6.

Question number	Answer	Additional guidance	Mark
	A description including two from: trace / mark where the ray went into and out of(through) the glass block / line on either side of glass block(1) (remove block) join entry and exit points (of ray of light) (1) use the protractor to measure the angle between the refracted/drawn ray and the normal (1)	accept 90° line etc.	(2)

Q7.

Question number	Answer	Additional guidance	Mark
	description including: infrasound < 20 Hz (1) ultrasound > 20 000 Hz (1)	 award 1 mark for infrasound lower frequency than ultrasound OR reverse argument	(2) grad