

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

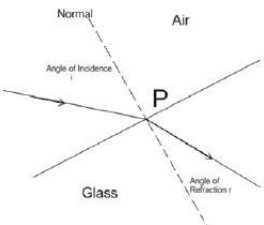
Mark Schemes

Q1.

Question Number	Answer	Mark
(i)	D refraction is the only correct answer <i>A 'deflection' is an incorrect distracting description</i> <i>B 'incidence' is incorrect, that would be angle X</i> <i>C 'reflection' is incorrect, no reflection being shown in the diagram</i>	(1) AO 1 1

Question Number	Answer	Additional guidance	Mark
(ii)	any pair of coordinates selected from the line (1) in range $\rightarrow$ 0.6(0) to 0.7(0) (1)	e.g. 20 and (13 or 14) or 10 and (6 or 7) ignore any units given award full marks for a correct answer without working	(2) AO 2 1

Question Number	Answer	Additional guidance	Mark
(iii)	an explanation linking: repeat (1) different angles / more values of X (1) for larger angles / values of X (1)	allow 'more measurements' / 'repeat experiment' / collect more data > 20°	(3) AO 3 3a

	Answer	Acceptable answers	Mark
(a)(i)	An explanation linking: Angle (of incidence) in glass (1) greater than critical angle / 42° (1)	Angle in air cannot be greater than 90° for 1 mark Glass has a higher refractive index than air for 1 mark	(2)
(a)(ii)	 angle i from normal in air (1) angle r from normal in glass (1)	accept for 1 mark angle i in air <u>and</u> angle r in glass/ <u>both</u> angles measured from normal	(2)
(a)(iii)	☒ C speed decreases		(1)
(b)(i)	An explanation linking any three of the following: (Optical fibres) bend (1) some fibres carry light to the inside of the patient (1) some fibres transmit the reflected light (1) light passes up/down fibres by TIR (1) light is reflected inside the patient (1) image is analysed by computer (1)	Accept suitable labelling on a Diagram Image projected on a screen	(3)
(b)(ii)	Either Breaks/blasts/smashes (1) Kidney stones (1) or Energy absorbed (1) to help repair muscle tissue (1) or Use of gel (1) to prevent loss of intensity (1) or	bruising/clots increases blood flow Allow (1) mark for suitable diagnosis e.g. prenatal scan	(2)

Q3.

SSQ NO:	Answer	Additional guidance	Mark
	(Jupiter is) 5 times (further away) (1) radio waves and light waves travel at the same speed (in space) (1)	All electromagnetic (EM) waves travel at the same speed accept attempt to use consistent speed (of light) to calculate two distances	(2)