Question Number	Answer		Mark
13(a)	Angles as 43° **and** 65° (+/− 1°) Use of $n_1\sin\theta_1 = n_2\sin\theta_2$ (allow use of $n = \frac{\sin i}{\sin r}$) Refractive index in range 1.29 to 1.37 (MP3 dependent on MP1) <u>Example of calculation</u> $n_1\sin\theta_1 = n_2\sin\theta_2$ $n_1 \times \sin(43°) = 1.00 \times \sin(65°)$ $n_1 = 1.33$	**(1)** **(1)** **(1)**	**3**
13(b)(i)	Unpolarised light has vibrations/oscillations in many/all planes Plane polarised light has vibrations/oscillations in one plane only Including the direction of wave travel **OR** Unpolarised light has vibrations/oscillations in many/all directions Plane polarised light has vibrations/oscillations in one direction only Perpendicular to the direction of wave travel (MP3 dependent on either MP1 or MP2) (MP3 – for "direction of wave travel" allow "direction of energy transfer" or "direction of propagation")	**(1)** **(1)** **(1)** **(1)** **(1)** **(1)**	**3**
13(b)(ii)	(Polarising) filter is rotated Filter not aligned with plane of reflected light, so less light transmitted **OR** (Polarising) filter positioned at 90° to the plane of the reflected light, so no light transmitted **OR** Place (polarising) filter so that it its plane of polarisation is vertical Horizontally polarised (reflected light) is not transmitted (Maximum 1 mark if using two filters)	**(1)** **(1)** **(1)** **(1)** **(1)** **(1)**	**2**
	Total for question 13		**8**