7. Waves

7.5 Polarisation

Paper 2

Marking Scheme

Q1.

(c)(i)	(I =) 8.5 × cos² 35° = 5.7 (W m^{-2})	**A1**
(c)(ii)	5.2 = 5.7 cos² θ (θ = 17°)	**C1**
	α = 35° + 17° = 52°	**A1**

Q2.

(a)(i)	light intensity has maximum value at 0°, 180°, 360° and zero intensity at 90°, 270°	**M1**
	'sinusoidally-shaped' curve	**A1**
(a)(ii)	4.2 = 7.6 cos$^2\theta$	**C1**
	θ = 42°	**A1**

Q3.

(a)(i)	oscillations are in a single direction, which is perpendicular to the direction of propagation (of the wave) **or** oscillations are in a single plane, which contains the direction of propagation (of the wave)	**B1**
(a)(ii)	light waves are transverse **and** sound waves are longitudinal	**B1**
(b)	$I = I_0 \cos^2\theta$	**C1**
	cos² θ = 1 / 4 so cos θ = 1 / 2 θ = 60° or 120° or 240° or 300°	**C1**
	angle of rotation = (120° – 90°) or (240° – 90°) or (300° – 90°) = 30° or 150° or 210° or 330°	**A1**

Q4.

(c)(i)	I_1 / I_0 = cos² 30°	**C1**
	= 0.75	**A1**
(c)(ii)	I_2 / I_1 = cos² 60° I_2 / I_0 = cos² 30° × cos² 60° **or** 0.75 × cos² 60°	**C1**
	= 0.19	**A1**