



Mark Scheme (Results)

Summer 2022

Pearson Edexcel International GCSE
In Physics (4PH1) Paper 2PR

(b)	<p>(i) period represented by 4 squares; correct use of x-scale; correct evaluation; e.g. period = 4 squares period = $4 \times 5.0 \times 10^{-3}$ period = 20 ms = 2.0×10^{-2} (s)</p> <p>(ii) substitution into given formula; correct evaluation; e.g. frequency = $1 / 0.02$ frequency = 50 (Hz)</p>	<p>allow ECF from wrong number of squares if clear in working -1 POT error answer of 0.01, 0.04 (s) scores 2 marks</p> <p>allow 0.02 (s)</p> <p>allow ECF from (i)</p>	<p>3</p> <p>2</p>
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Total for Question 2 = 10 marks

Question number	Answer	Notes	Marks
6 (a) (i)	angle of incidence;	ignore incident ray	1
(ii)	recognising 67 (degrees) as anomalous; evaluation of a mean; e.g. mean angle = $(22 + 23) / 2 = 23$ (degrees)	allow 1 mark if anomalous result included e.g. 37, 37.3... (degrees) allow 22, 22.5 (degrees)	2
(iii)	n calculated for multiple angles; mean value obtained for n; OR idea of graph plotted of $\sin(i)$ against $\sin(r)$; n found from gradient of $(\sin(i)-\sin(r))$ graph;		2
(b) (i)	substitution into $n = \sin(i) \div \sin(r)$; evaluation; e.g. refractive index = $\sin(82) \div \sin(47)$ (refractive index =) 1.4	1.3 scores 1 mark only allow 1.35...	2
(ii)	$\sin(c) = 1/n$;	allow any correct rearrangement	1
(iii)	substitution and rearrangement; evaluation; e.g. $c = \sin^{-1}(1/1.7) = \sin^{-1}(0.588...)$ (critical angle =) 36 (degrees)	 allow 36.03... (degrees)	2
(c)	light undergoes TIR; (because) angle (of incidence) is greater than critical angle;		2

Total for Question 6 = 12 marks