Question number	Answer	Notes	Marks
11 (a)	D;		1
(b)	Any four of - MP1. mention of ray box/pins; MP2. Use of protractor; MP3. (vary *i* to) obtain a range of values; MP4. statement of equation; $n = \frac{\sin i}{\sin r}$ MP5. plot a graph of sin *i* against sin *r*; OR calculate/work out/ find *n*; MP6. find gradient of graph; OR calculate average of n; MP7. sensible experimental precaution; OR improvement to a basic method;	ignore reference to critical angle allow Snell's Law equation in words allow correct use of A and D from diagram including – • draw lines with a ruler, • use a thinner beam/slit, • use a monochromatic beam, e.g. red, • fix block firmly in position, • set any anomalous readings aside, • use a sharp pencil, • use a more precise protractor e.g. to ½°	4

Total 5 marks