

Lenses

Mark scheme

1.	(a)	(i)	rays continued to meet on the right hand side of the lens and beyond <i>must be straight lines from the right hand side of the lens</i> <i>ignore details through the lens</i> <i>allow if no arrows</i>	1
			meet exactly on the axis <i>negate mark if contradictory arrow(s) added</i> <i>do not need to go beyond the focus for this mark</i>	1
		(ii)	(principal) focus <i>or focal (point)</i>	1
		(iii)	converging <i>or convex</i>	1
	(b)	(i)	A	1
		(ii)	rays seem to come from this point <i>or words to this effect</i> <i>or shows this on the diagram</i>	1
		(iii)	diverging <i>or concave</i>	1
	(c)	film	<i>accept any unambiguous method of showing the correct response</i>	1
		smaller than		1
		further away from		1
	(d)	any three from:		3
		•	real image can be put on a screen <i>allow film</i>	
		•	virtual image cannot be put on a screen / film	
		•	virtual image is imaginary	
		•	real image is formed where (real) rays cross / converge <i>allow real image has light travelling through it</i>	
		•	virtual image is where virtual / imaginary rays (seem to) come from <i>or virtual image is where rays seem to come from</i>	
		•	virtual image formed where virtual rays intersect / cross	

[13]

P3.1.3 Mark Scheme

2. (a) (i) (angle of) refraction 1
*take care **not** to credit 'angle of reflection'*
- (ii) normal 1
*do **not** credit 'horizontal'*
- (b) **either**

(photographic) film
- or** CCD(s) (charge-coupled device(s)) / CMOS(s) (sensor(s)) / (active) pixel sensor(s) 1
*accept 'LDR(s)' / 'light dependent resistor(s)'
not lux meter
do **not** accept light sensor(s)*
- (c) (i) converging 1
***or** 'convex'*
- (ii) **either**
(0).35
or (0).4(1...) 2
*do **not** give any credit for an answer greater than 1
or $7 \div 20$ for 1 mark
or clear evidence that appropriate measuring / counting, has been made for 1 mark*
- (d) otherwise it will have no effect on the light detector
- or** otherwise no (real) light will fall on the light detector 1
***or** 'a virtual / imaginary image will have no effect on the light detector'
allow error carried forwards for 'light detector'
allow so it can be formed on the film*

[7]