Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

LEVEL 2

PHYSICS

MARK SCHEME

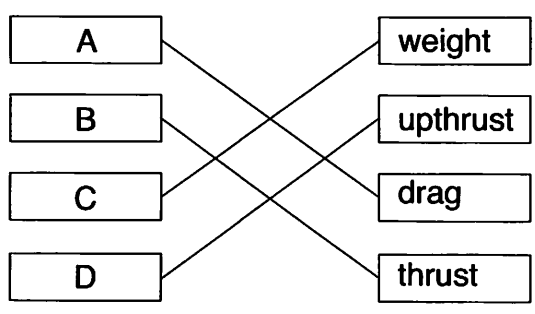
This is a suggested, not a prescriptive, mark scheme.

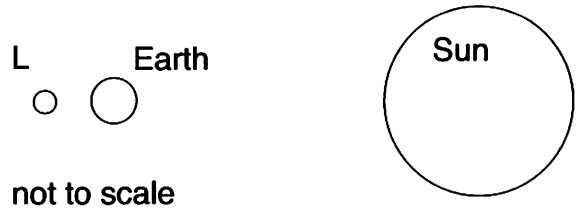
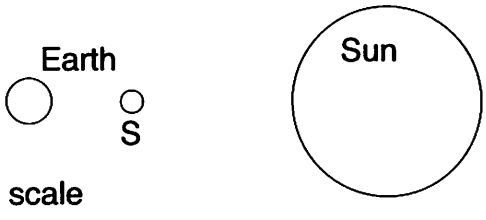
Wednesday 6 November 2013

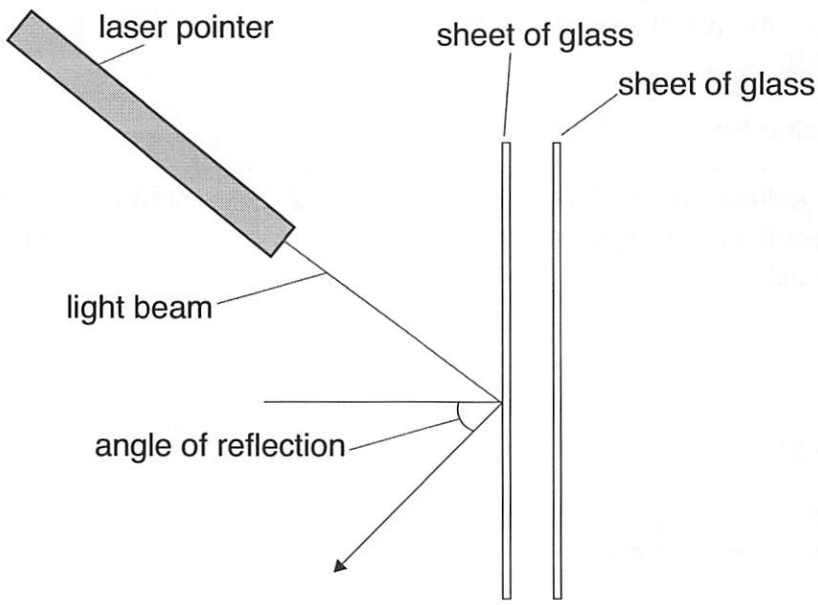
283131M32

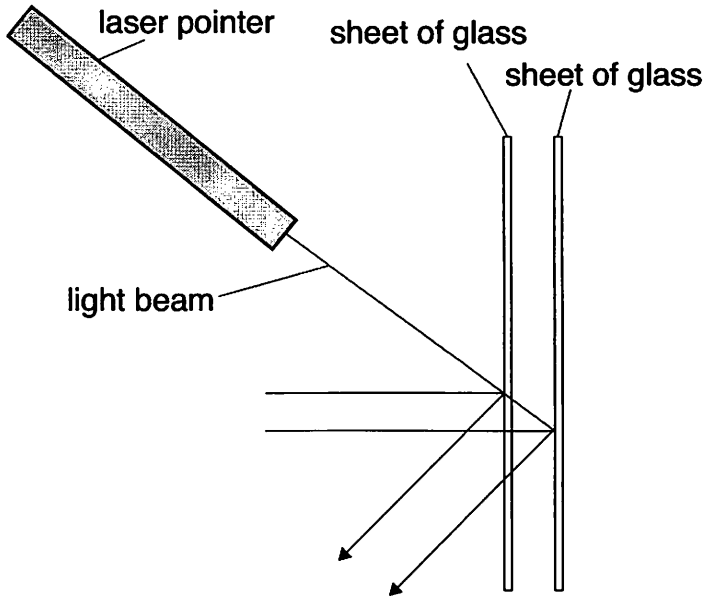
© Independent Schools Examinations Board

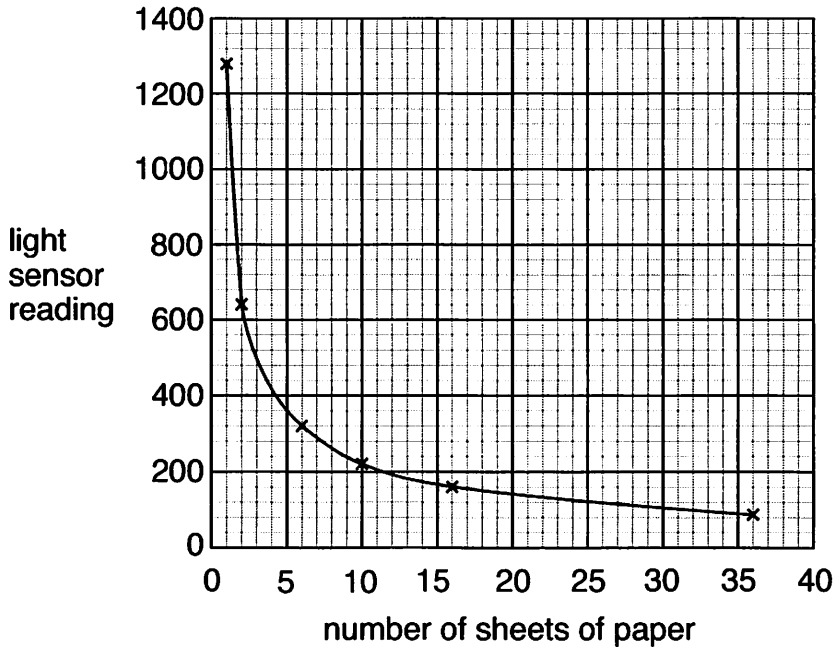
Although candidates should be encouraged to show their working clearly, full marks should be awarded for the correct answer to numerical questions even if the working is not shown.

Q.	Answer	Mark	Additional Guidance
1. (a)	cm^2	**9**	
(b)	450 N		
(c)	unbalanced		
(d)	in a straight line		
(e)	large amplitude		
(f)	Jupiter		
(g)	biomass		
(h)	strain energy		
(i)	magnetised		
2. (a)	series	**1**	
(b) (i)	light emitting diode (LED)	**1**	
(ii)	resistor	**1**	
(c)	0.02 A because when connected in series the current in a circuit is the same at all places	**2**	
(d)	current decreases LED becomes dimmer/goes out the battery is not able to drive such a large current around the circuit/is running out of energy	**3**	accept equivalent wording accept 'the battery's voltage is falling'
3. (a)	from electrical; to kinetic	**2**	
(b)		**2**	1 mark if one or two correct

Q.	Answer	Mark	Additional Guidance
(c)	force A = force B force C = force D	2	
(d)	the boat slows/moves more slowly less energy from the Sun means less power to the motor (which will produce a smaller thrust)	2	
4. (a)	 not to scale	1	
(b)	the Moon must be on the opposite side of the Earth to the Sun for the shadow of the Earth to fall on it that is the position for a full Moon	2	
(c)	in a total lunar eclipse, the entire Moon goes dark, but in a partial lunar eclipse some of the Moon can still be seen	2	must compare the two for both marks
(d)	*any one of:* at this time: it is daylight in Europe Europe is not facing away from the Sun/is on the wrong side of the Earth the Moon is not above the horizon	1	
(e)	 not to scale	1	

Q.	Answer	Mark	Additional Guidance
5. (a)	A and F	1	accept just A or just F, but no mark if any other letter given
(b)	gravitational potential (energy)	1	accept 'gravitational' or 'potential'
(c)	kinetic and gravitational potential it is moving so has kinetic energy; it is not at the bottom so has some gravitational potential energy	2	both forms required either form explained accept 'some of its gravitational energy has been converted into kinetic energy'
(d)	(dissipated) as heat (and sound)	1	
6.			
(a) (i)	ray at correct angle	1	
(ii)	angle correctly identified	2	the normal must be drawn but need not be labelled
(b) (i)	the beam is reflected off the front piece of glass and off the back piece of glass	2	accept 'reflection off front and back of glass' for both marks

Q.	Answer	Mark	Additional Guidance
(b) (ii)			the second normal need not be shown
	beam goes through first piece of glass is reflected at approximately the correct angle from second piece of glass	**2**	ignore refraction in the glass allow 1 mark only if both beams reflect from the first sheet
(c)	some of the light goes through the glass/not all is reflected (as it is by a mirror)	**1**	accept 'because the beam is split into two beams'
7. (a) (i)	(electronic) scales/balance	**1**	
(ii)	measure mass (m) of whole pile number of sheets = m × 25 ÷ 10	**3**	1 mark for measure mass; 2 marks for any correct description of how number of sheets can then be found
(b)	51.5 mm	**1**	
(c)	51.5/500 = 0.103 mm	**2**	 allow e.c.f. from (b)

Q.	Answer	Mark	Additional Guidance
(d)			
(i)	points correct (deduct one for each error)	**2**	
(ii)	curve (not succesion of straight lines) which is a good fit	**1**	
(e)	*sensible comments, e.g.:* 'yes' for up to 5 sheets (or up to 10 sheets) not for more sheets as the reading does not change much	**2**	*could be:* 'no, as the change is not linear/constant/ consistent' *or* 'no, as the brightness of the lamp might change'
(f)	*e.g.:* series circuit with cell, LDR and ammeter correct symbols	**3**	
Total		**60**	