Independent Schools Examinations Board

COMMON ENTRANCE EXAMINATION AT 13+

SCIENCE

PHYSICS

MARK SCHEME

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

Wednesday 3 November 2010

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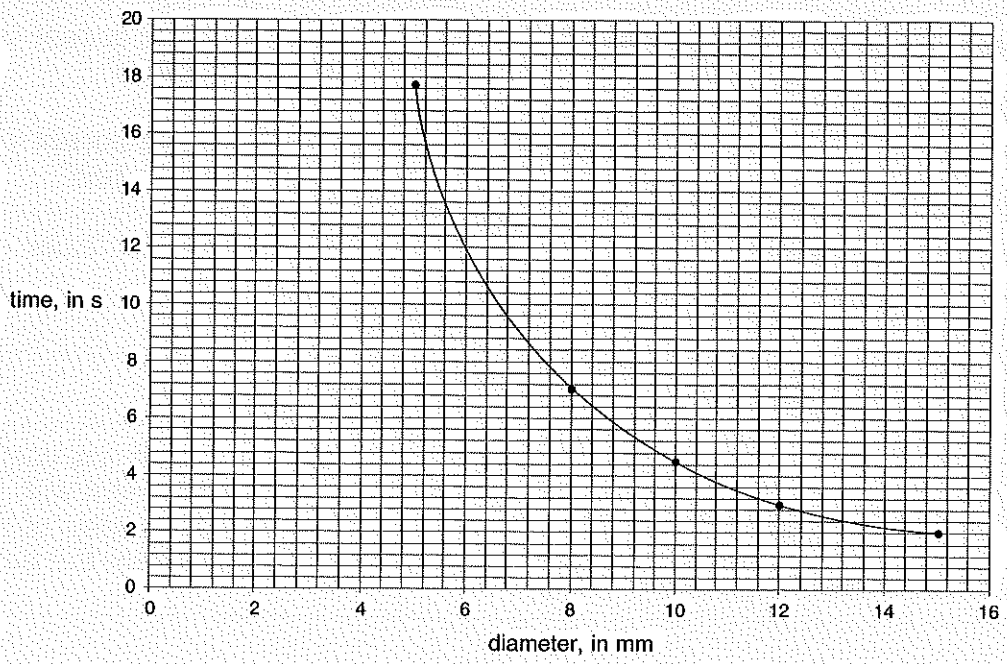
Although candidates should be encouraged to show their working clearly, full marks should be awarded for the correct answer to numerical questions even if the working is not shown.

Q.	Answer	Mark	Additional Guidance
1. (a)	Saturn	8	
(b)	10 cm		
(c)	a north-seeking pole		
(d)	in the opposite direction to motion		
(e)	light from the Sun is reflected from it		
(f)	kinetic energy		
(g)	adding a cell		
(h)	63 g		
2.	the light reflects (off the surface) off both pieces of glass	2	accept reflection off back surface of glass
3. (a)	the prongs vibrate when struck	1	
(b)	the prongs cause the air to vibrate vibrations in the air/sound waves travel to the ear and cause the eardrum to vibrate	2	accept any two
(c)	the sound is louder	1	
(d)	the pitch is higher because the prongs vibrate faster	2	
4. (a) (i)	gravity	1	
(ii)	December	1	
(b)	the northern hemisphere is tilted away from the Sun so does not receive as much heat/radiation from the Sun	2	
(c)	Venus can be anywhere inside the orbit of the Earth but not inside the Sun	1	
(d)	The Sun is a (star.) The Milky Way is a (galaxy)	2	

Q.	Answer	Mark	Additional Guidance
5. (a)	speed = distance/time	1	
(b)	20 m	1	
(c)	speed = 20/100 = 0.2 m/s	3	accept correct answers in cm/s
(d)	zero	1	accept 'constant at zero'
(e)	20 m	1	
6. (a)	**X** : cell **Y** : switch **Z** : lamp	3	
(b)	ammeter in series anywhere correct symbol	2	
(c)	current will increase lamp will get brighter	2	allow 'lamp might blow'
7. (a)	energy resource is being replaced continuously/within a human lifetime	2	do not accept 'is not used up' do not accept 'can be used again'
(b)	thermal/heat/internal sound	2	in either order
(c)	wave height varies	1	
(d)	*e.g.:* does not produce carbon dioxide so does not lead to global warming	2	accept any correct statement with explanation of why this is good for the environment

Q.	Answer	Mark	Additional Guidance
8. (a)	850 cm^3	1	
(b)	12	1	
(c)	to help to reduce uncertainty to allow anomalies to be spotted	2	allow any suitable comments which indicate that candidate understands the advantage of taking several measurements and finding an average do not allow 'fair test'
(d)	9.0	1	
(e)	average/s (17.6) 6.9 4.5 3.1 (2.0)	2	1 mark for 4.5 since error has not been included 1 mark for other two values
(f)		2	2 marks if all points correctly plotted 1 mark if two or more correctly plotted
(g)	smooth curve which is a reasonable fit	1	

Q.	Answer	Mark	Additional Guidance
(h)	12 s	**1**	value read correctly from candidate's graph; ignore unit
(i)	as the diameter gets bigger the time gets shorter more gradually/less effect when spheres are large	**2**	*or* the converse second mark for describing implication of the curved nature of the line
(j)	*three sensible and relevant points, e.g.:* the larger spheres are much heavier there is an upwards force/drag as the diameter of the sphere gets bigger, the downward force increases more rapidly than the upward force	**3**	
Total		**60**	