

Mark Scheme for June 2010

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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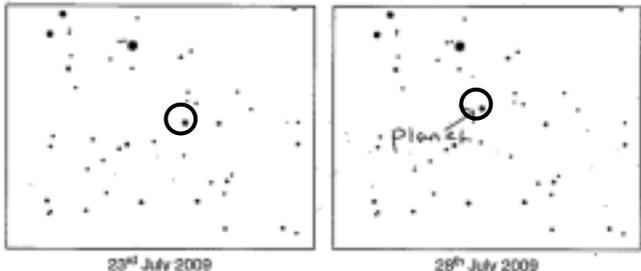
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Question		Expected Answers	Marks	Additional Guidance									
1	a	absorbs (1) more (1) damages (1)	[3]										
	b	<table border="1"> <tr> <td></td> <td>gases</td> <td>effect</td> </tr> <tr> <td>ozone</td> <td></td> <td></td> </tr> <tr> <td>greenhouse</td> <td>carbon dioxide (1)</td> <td>global warming/climate change (1)</td> </tr> </table>		gases	effect	ozone			greenhouse	carbon dioxide (1)	global warming/climate change (1)	[2]	allow methane instead of CO ₂
	gases	effect											
ozone													
greenhouse	carbon dioxide (1)	global warming/climate change (1)											
	c	i volcanic eruptions (1)	[1]	accept example of earthquake eruption. Eg Mt Pinatubo									
		ii names two variables (1) correct direction of link (1) e.g. increased sulfate particles and decreased ozone	[2]	other examples are: more sulfate particles leads to slower repair of ozone hole more sulfate particles leads to greater surface area for reactions more sulfate particles reflects more sun light more volcanic eruptions decrease ozone levels more volcanic eruptions decrease planet temperature.									
	d	any two from: food crops not growing; extreme weather conditions / a named example; rising sea levels/flooding low lying land (due to rising sea levels);	[2]	not thinning of ozone layer not "global warming" on its own allow destroy habitats leading to extinction.									
	e	i risk - idea of more uv radiation/ozone destruction (1) benefit - reduced global warming/less climate change/sunlight reflected(1) situation – when climate change is becoming catastrophic/specific example e.g. severe global flooding (1)	[3]	ignore 'planet becomes too cool' ignore 'cools the planet' or reference to temperature accept specific examples of the benefits of reduced global warming e.g. reduces sea level rising									
		ii physical barrier to uv e.g. sun-screen, clothing / keep out of sun/in shade (1)	[1]	reject general remarks such as 'protect from sun' allow 'put on sun protection' (this assumes sun protection is some form of cream)									
Total			[14]										

Question			Expected Answers	Marks	Additional Guidance
2	a	i	correctly labelled planet (1) 	[1]	
		ii	move differently from (fixed) stars / retrograde/complex motion (1)	[1]	allow 'move more' comparison with (fixed) stars is required, not just 'it moves'
	b	i	Earth rotates/spins / stars move across the sky / around the pole star / the camera is open for along time so the stars move (1)	[1]	'Earth moves' is insufficient
		ii	6 (1)	[1]	
	c		Idea of Earth on opposite sides of its orbit (1) facing different directions/looking at different part of the sky (1)	[1] [1]	both marks can be gained from diagram allow 1 mark only for observer has moved to other side of earth argument
	d		any two from: idea that the Earth orbits the sun (in the same sense as the Earth's spin) (1) idea of earth has to rotate more (than 360°) (1) idea that the Sun returns to the same position (in the sky) (1)	[2]	
	e		idea of angle (1) additional detail of how to use the angle e.g. across and up / azimuth is angle from North (1)	[1] [1]	accept declination measured from equator or right ascension measured from the vernal equinox ignore coordinates latitude and longitude are insufficient on their own
	f	i	C (1)	[1]	

Question			Expected Answers	Marks	Additional Guidance
2	f	ii	<p>any two from:</p> <p>benefit of remote control;</p> <p>Idea of greater precision;</p> <p>tracking of stars / idea of used over a long period of time (astronomical objects);</p>	[2]	<p>e.g. she doesn't have to be outside/she can do something else/saves time</p> <p>reject ideas about image processing or sharing data</p> <p>allow greater accuracy/finding stars more easily</p> <p>ignore human error</p>
Total				[13]	
3			<p>includes Earth, Moon and Sun in explanation (1)</p> <p>Moon in between Earth and Sun (1)</p> <p>Moon blocks light from Sun/casts shadow (1)</p>	[3]	all marking points may be shown on a diagram
Total				[3]	
4	a	i	W (1)	[1]	
		ii	<p>1/0.8 (1)</p> <p>1.25 (1)</p> <p>D or Dioptre (1)</p>	[3]	2 marks for correct numerical answer
		iii	<p>...largest diameter. <input checked="" type="checkbox"/> (1)</p> <p>...longest focal length. <input type="checkbox"/></p> <p>...the most powerful. <input type="checkbox"/></p> <p>...collect the most light. <input checked="" type="checkbox"/> (1)</p>	[2]	
	b		2 (1)	[1]	
	c		(concave) mirror (1)	[1]	ignore reflector
Total				[8]	

Question			Expected Answers	Marks	Additional Guidance	
5	a	i	luminosity (1) peak frequency of light (1)	[2]		
		ii	6973(.15) (1)	[1]		
	b	i	A (1) C (1)	[2]		
		ii	electrons (1) line (1)	[2]		
Total				[7]		
6	a		...small positive centre. <input checked="" type="checkbox"/> (1) ...smallest possible particles. <input type="checkbox"/> ... large positive charges <input type="checkbox"/> ... large negative charge <input type="checkbox"/>	[1]		
		b	i	reflection <input type="checkbox"/> nuclear fusion <input checked="" type="checkbox"/> (1) combustion <input type="checkbox"/> nuclear fission <input type="checkbox"/>	[1]	
				ii	inside Sun: radiation (1) convection (1) Sun to Earth: radiation (1)  QWC – two ideas, clear expression/ distinction between internal and external transfers (1)	[3] [1]
Total				[6]		

Question			Expected Answers	Marks	Additional Guidance
7	a		1000000 / 1 million / 10^6 (1)	[1]	reject mega!
	b	i	B / Cepheid (variables stars) (1)	[1]	
		ii	200 x 70 (1) 14000 (1)	[2]	award 2 marks for correct numerical answer of 14000
			Total	[4]	

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