



*Rewarding Learning*

**General Certificate of Secondary Education  
2011–2012**

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**Science: Single Award (Modular)**

Road Safety, Radioactivity  
and Earth in Space

Module 6

Higher Tier

**[GSC62]**

**MONDAY 14 NOVEMBER 2011, 2.30 pm–3.15 pm**

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**MARK  
SCHEME**

			AVAILABLE MARKS	
1	(a) (i)	Above/more than; action level [2]	[2]	10
		More than/above 200 [1]		
	(ii)	Damage (living) cells/DNA	[2]	
		Cause cancer		
	(b) (i)	3.8 days	[1]	
7.6 days or consequential marking		[1]		
(c)	combinations of protons and neutrons [1]			
	unstable [1]	[2]		
(d)	radiation kills microbes;			
	increase shelf life/keep fresh <b>longer</b>	[2]		
2	(a)	Clouds of hydrogen gas;		6
		Pulled together by gravity;		
		Nuclear fusion takes place	[3]	
(b)	The distance;			
	Light travels in 1 year	[2]		
(c)	Radio telescopes/ref to radio signals	[1]		
3	(a)	GRAPH A		11
		Most accidents happen early in the morning [1]		
		More people driving home who have been drinking [1]		
	GRAPH B			
	More accidents happen at the weekend [1]			
	More people drinking at the weekend [1]	[4]		
	(b)	Alcohol slows down reactions;		
		Increases thinking time/increases stopping distance	[2]	
	(c) (i)	Any <b>two</b> from:		
		Advantages:		
Extra money used in public sector;				
People will use less fuel/fossil fuels last longer/stop unnecessary journeys/less <i>air</i> pollution;				
use more public transport;				
Decrease in carbon emissions/global warming	[2]			
Any <b>two</b> from:	Disadvantages:			
	People unhappy (take strike action)/protests/vote against government;			
	food and energy costs increase/family poverty			
	Increase in fuel smuggling/illegal fuel (laundering)	[2]		
(ii)	Increase in the price of oil/increase in costs	[1]		

			AVAILABLE MARKS
<b>4</b>	Produces gamma radiation which can pass through tissue [1] It has a short half life [1] Not in body too long [1]	[3]	3
<b>5</b>	<b>(a) (i)</b> Meteorite/asteroid/comet  <b>(ii)</b> Dust clouds; (would be sent high into atmosphere) reducing sunlight; causing plants to die Accept description of hitting water	[1]     [3]	
	<b>(b)</b> Earth is at the centre of the Solar System; The order of the planets is incorrect	[2]	
	<b>(c)</b> The galaxies are moving away from each other; The galaxies further away move faster; Universe is expanding/must have started with an expansion	[3]	9
<b>6</b>	<b>(a) (i)</b> The forward force is equal to the friction/forces are balanced  <b>(ii)</b> Gravity pulls trolley down; overcoming friction; providing an unbalanced force (making trolley accelerate)	[1]    [3]	
	<b>(b)</b> 62.4/12 [1] 5.2 m/s	[2]	6
		<b>Total</b>	<b>45</b>