



*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]

**THURSDAY 24 MAY 2012**

**9.15 am–10.00 am**

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**MARK  
SCHEME**

			AVAILABLE MARKS	
1	(a) (i)	5 points correct – 2 marks 4 points correct – 1 mark correct line = 1 mark	[3]	8
	(ii)	As speed increases the braking distance increases.	[1]	
	(b)	Ice/rains/gravel/mud/ref. to condition of tyres reduces the friction.	[2]	
2	(c)	Crumple zone; absorbs the energy in a crash.	[2]	7
	(a)	Any two from: Distances very large; power supply insufficient; time scale would be too great.	[2]	
	(b)	Any two from: <ul style="list-style-type: none"> <li>● Looking for other natural resource/any named natural resource</li> <li>● Earth is becoming overpopulated/looking for planet similar to earth</li> <li>● Looking for extra-terrestrial</li> </ul>	[2]	
3	(c)	Clouds of hydrogen; pulled together by gravity; nuclear fusion takes place/helium formed. (must be in order)	[3]	5
	(a)	Males have more fatalities than females; Young males have more fatalities than older males.	[2]	
	(b) (i)	4 mm	[1]	
	(ii)	Drugs slow down your reactions/increases thinking time this increases thinking/distance/overall stopping dist.	[2]	

4 (a) (i)

Position	Type(s) of radiation
A	alpha, beta, gamma
B	beta, gamma
C	gamma

All 3 rows correct 3 marks. 2 rows correct – 2 marks.  
1 row correct – 1 mark.

[3]

(ii) Small amounts are present in the background.

[1]

(iii) Combination of protons and neutrons are unstable; and disintegrate/decay.

[2]

(b) (i) The time it takes;  
for the radiation (count) to fall by half.

[2]

(ii) 45g.

[1]

9

5 (a) Environmental  
No fossil fuels used;  
so stocks conserved/  
or less CO<sub>2</sub> produced;  
less global warming

Economic  
cost of fuels rising;  
fossil fuels running out

[4]

(b) 54 300/1810;  
30 m/s

[2]

6

6 (a) (i) Gravity pulls the marble down;  
overcoming friction;  
provides an unbalanced force.

[3]

(ii) Speed at start;  
speed at the end;  
time taken to travel between these two points.

[3]

(iii) 0.4/0.28;  
1.43 m/s

[2]

(b) Reduce speed over a greater distance;  
less chance of serious crashes occurring.

[2]

10

**Total**

**45**