



Rewarding Learning

General Certificate of Secondary Education
2010–2011

Science: Single Award (Modular)

Materials and their Management
Module 4

Higher Tier

[GSC42]

FRIDAY 25 FEBRUARY 2011, MORNING

**MARK
SCHEME**

			AVAILABLE MARKS	
1	(a)	1. bottle banks, door step collection and segregation [1] 2. collection and transport [1] 3. reprocessing of cullet [1] 4. furnace/remoulding [1] any three	[3]	7
	(b) (i)	not broken down [1] by microbes [1]	[2]	
	(ii)	advertising [1], bins for recycling [1]	[2]	
2	(a) (i)	oil is heated [1], different fractions boil at different temperatures [1], vapours rise up column and separate [1], vapours are condensed [1]	[3]	7
	(ii)	heating oil	[1]	
	(b)	many molecules are chemically joined [1] into long chains [1]	[2]	
	(c)	use renewable fuels	[1]	
3	(a) (i)	arch [1], loop [1]	[2]	7
	(ii)	carbon	[1]	
	(iii)	get fingerprints of suspect [1] and compare with those at the scene of the crime [1] idea of unique fingerprint/compare to data base	[2]	
	(b) (i)	everyone's finger print	[1]	
	(ii)	solves more crime or solves crime faster	[1]	
4	(a) (i)	A	[1]	
	(ii)	D [1] as no lather after boiling and a lather after addition of washing soda [1] (both points needed for 2nd part)	[2]	
	(b)	any two : same volume water/same volume washing soda/same number of drops of soap solution/same time for boiling	[2]	
	(c)	ion exchange/distillation	[1]	

			AVAILABLE MARKS	
(d) (i)	$\text{Ca}(\text{HCO}_3)_2$	[1]	10	
(ii)	good for teeth and bones or tastes better good for brewing beer good for tanning leather reduced risk of heart disease	[1]		
(iii)	water [1], carbon dioxide [1]	[2]		
5 (i)	C_2H_4	[1]	7	
(ii)	$ \begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\ \quad \quad \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ \quad \quad \\ \text{H} \quad \text{H} \quad \text{H} \end{array} $	[1] for all correct C–H [1] for all correct C–C		[2]
(iii)	strong [1] and waterproof [1] flexible/durable	[2]		
(iv)	breaking large hydrocarbon molecules into smaller molecules [1] using heat [1]	[2]		
6 (a)	C_2H_8 [1], C_7H_{18} [1], 2HCl_2 [1]	[3]	7	
(b) (i)	D	[1]		
(ii)	C	[1]		
(iii)	B	[1]		
(c)	Cl^-	[1]		
Total			45	