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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

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| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| **1** | **(a)** | 1. bottle banks, door step collection and segregation [1]<br>2. collection and transport [1]<br>3. reprocessing of cullet [1]<br>4. furnace/remoulding [1]<br>any **three** [3] | | |
| | **(b)** | **(i)** not broken down [1] by microbes [1] [2] | | |
| | | **(ii)** advertising [1], bins for recycling [1] [2] | | 7 |
| **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] | | |
| | | **(ii)** heating oil [1] | | |
| | **(b)** | many molecules are chemically joined [1] into long chains [1] [2] | | |
| | **(c)** | use renewable fuels [1] | | 7 |
| **3** | **(a)** | **(i)** arch [1], loop [1] [2] | | |
| | | **(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] | | 7 |
| **4** | **(a)** | **(i)** A [1] | | |
| | | **(ii)** D [1] as no lather after boiling<br>and a lather after addition of washing soda [1]<br>(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] | | |

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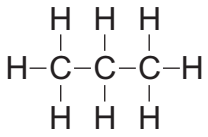
| | | | | AVAILABLE MARKS |
|---|---|---|---|---|
| | **(d)** | **(i)** $Ca(HCO_3)_2$ | [1] | |
| | | **(ii)** good for teeth and bones<br>**or** tastes better<br>good for brewing beer<br>good for tanning leather<br>reduced risk of heart disease | [1] | |
| | | **(iii)** water [1], carbon dioxide [1] | [2] | 10 |
| **5** | **(i)** | $C_2H_4$ | [1] | |
| | **(ii)** |  [1] for all correct C–H<br>[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]<br>using heat [1] | [2] | 7 |
| **6** | **(a)** | $C_2H_8$ [1], $C_7H_{18}$ [1], $2HCl_2$ [1] | [3] | |
| | **(b)** | **(i)** D | [1] | |
| | | **(ii)** C | [1] | |
| | | **(iii)** B | [1] | |
| | **(c)** | $Cl^-$ | [1] | 7 |
| | | | **Total** | **45** |