

**CAMBRIDGE**  
INTERNATIONAL EXAMINATIONS

**NOVEMBER 2002**

**INTERNATIONAL GCSE**

**MARK SCHEME**

**MAXIMUM MARK : 60**

**SYLLABUS/COMPONENT : 0654/6**

**CO-ORDINATED SCIENCES  
(ALTERNATIVE TO PRACTICAL)**



UNIVERSITY of CAMBRIDGE  
Local Examinations Syndicate

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- 1
- (a) 39s 22s 13s 7s  
4 correct 2  
2 or 3 correct 1  
1 or 0 correct 0 [2]
- (b) labelling of axes 1  
choice of scale 1  
plotting (completely correct) (1)  
curve (1) [4]
- (c) higher the temperature, lower the time taken OWTTE [1]
- (d) +/- 1 s value depends on candidate's graph [1]
- (e) Plot 1/time taken against temperature (or find gradients) [1]
- (f) Surround with crushed ice [1]

total ten marks

- 2.
- (a) (i) 7.5 +/- 0.1, 8.4 +/- 0.1 [2]  
(ii) 7.6, 8.3 (ecf) [2]  
(iii)  $\frac{\text{change in length}}{\text{original length}} \times 100$   
 $0.4/8.0 \times 100 = 5\%$  [2]
- (b) (i) water moves out of potato (by osmosis) OWTTE [1]  
(ii) water moves into potato OWTTE [1]
- (c) solution C has the same water potential/osmotic potential (1)  
no (net) movement of water into or out of cells OWTTE(1) [2]

total 10 marks

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3. (a) 775 352 128 67 17 9  
6 or 5 correct (2) 4 or 3 correct (1)  
2, 1 or 0 correct (0) [2]
- (b) to find background count [1]
- (c) (i) gamma only (1)  
(ii) alpha and beta (2)  
(iii) alpha only (1) [3]
- (d) do not point at people  
use (lead) shield  
warning sign  
keep in store unless being used (any one) [1]
- (e) locked away  
in lead shield  
with warning sign (any 2) [2]

total 10 marks

4. (a) (i) A inspired, B expired [1]  
(ii) limewater (1) goes cloudy/milky (1)  
OR bicarbonate indicator (1) goes yellow (1) [2]  
(iii) tube B (1)  
expired air contains more carbon dioxide OWTTE (1) [2]
- (b) (i) C 22s D 8s [2]  
(ii) faster breathing/ more energy needed/  
higher respiration rate/gaseous exchange/  
using more carbohydrate (any 2) [2]
- (c) more oxygen in inspired air than in expired air [1]

total ten marks

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- 5.
- (a)  $M1 = 38.2$        $M2 = 41.7$        $M3 = 3.5 \text{ g}$   
 $T1 = 25.5$        $T2 = 16.8$  [5]
- (b)  $T2 - T1 = -8.7^\circ\text{C}$  (negative sign not necessary) [1]
- (c) (i) correct division by 1000 = 0.0382kg [1]  
(ii)  $0.0382 \times 670 = 25.594 \text{ J}$  (25.6 J) [1]
- (d)  $8.7 \times (105 + 25.6) = 1136 \text{ J}$  (ecf) [1]
- (e) endothermic because temperature falls/energy is absorbed. [1]

total ten marks

- 6
- (a) filter the juice (1)  
boil (1) to partly (1) evaporate  
leave to cool and crystallise (1) any 3 points [3]
- (b) dissolve the (weighed) crystals (1)  
in a measured volume of water (1)  
take a (measured) volume (1) add indicator (1)  
add (measured volumes of) sodium hydroxide solution (1)  
note volume needed for indicator colour to change (1)  
add same volumes without indicator (1)  
evaporate solution(1) and allow to crystallise (1)

any 7 points [7]

total ten marks