

**JUNE 2002**

**INTERNATIONAL GCSE**

**MARK SCHEME**

**MAXIMUM MARK : 60**

**SYLLABUS/COMPONENT : 0654/6**

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



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1. (a) 1.1, 1.4, 1.8, 2.0 cm [4]
- (b)(i) points plotted correctly (2)  
smooth line of best fit (if extended, must pass through origin)(1) [3]
- (ii) activity increases with surface area (1)  
proportional to surface area(1) [2]
- (iii) more cells cut more enzyme released/greater surface area [1]

total 10 marks

2. (a) (i) 40 cm (1)  
(ii) 40cm (1)  
(iii) 40g (1) [3]
- (b) (i)  $30 \times 40 = 1200$   
 $m \times 10 = 1200$   
 $m = 120 \text{ g}$  (working must be shown) [3]
- (ii) 4 cm side (1), volume =  $4^3 = 64 \text{ cm}^3$  (1)  
(working must be shown) [2]
- (c) (i) arrow points towards the pivot (1)  
(ii) because the cube is lighter in water OWTTE (1) [2]

Total ten marks

3. (a) (potassium carbonate), because there is a residue  
on adding  $\text{KHCO}_3$  to water OWTTE (mark for reason)(1) [1]
- (b) (i) any value above 7 [1]  
(ii) It increases [1]
- (c) carbon dioxide (1) [1]
- (d) ammonia (1) [1]
- (e) no gas given off (1) white ppt (1) [2]

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- (f) Place hydrochloric acid in a suitable vessel and add the white powder (1) using a thermometer to find the temperature before and after the reaction (1) temperature rise with potassium carbonate or fall with potassium hydrogencarbonate (1) [3]

total ten marks

4. (a) temperature/ air(oxygen)/ light [1]

- (b)(i) suitable table drawn to show columns for dish, germination and growth(1)  
 dish A germinated and grown successfully (1)  
 dish B germinated but growth stunted OWTTE (1)  
 dish C no germination no growth (1) [4]

- (ii) acid rain reduces germination and stunts growth (1)  
~~effect more marked was acid strength increases(1)~~ [2]

- (c) make solutions of known pH (1)  
 known number of seeds (1)  
 grow in controlled conditions (1)  
 count and work out percentages (1) any 3 points [3]

total 10 marks

5. (a) attracts insects (1) to pollinate flower (1) [2]

- (b) ethanol dissolves colour better/better solvent than water (1) [1]

- (c)(i) closed (1) vessel with eluent (1) below start line(1) [3]  
 (ii) two spots shown(1) vertically above start line (1) [2]

- (d) add acid/alkali to see colour change(1)  
 one or both reagents named (1) [2]

total 10 marks

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6. (a) 78      57      47 mA [3]
- (b) points plotted correctly (1)  
smooth curve (NOT straight) drawn (1) [2]
- (c) 36mA (answer based on candidate's graph)) [1]
- (d) 42 ohms (error carried forward) [1]
- (e) circuit drawn including ammeter in series with a power source  
and variable resistor showing a voltmeter in parallel with a suitable  
wire or resistor(1)  
explanation, vary resistance and find current and p.d. each time (1)  
plot V against A and obtain a straight line passing through  
the origin OWTTE (1) [3]

total ten marks