CAMBRIDGE
INTERNATIONAL EXAMINATIONS

JUNE 2002

INTERNATIONAL GCSE

# MARK SCHEME

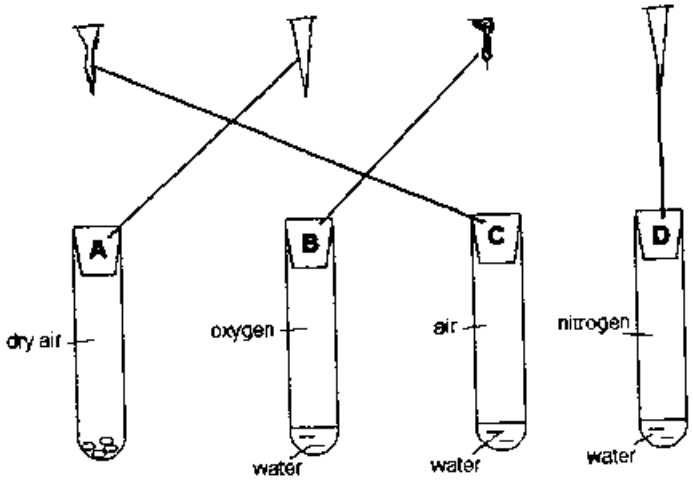
## MAXIMUM MARK : 100

## SYLLABUS/COMPONENT : 0654/2

## CO-ORDINATED SCIENCES (CORE)

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

1(a)




all correct = 2 one correct = 1 — 2

(b) oxidation;
oxygen **reacts** with / **joins** with the iron; — 2

(c) **absence** of oxygen / air;
**absence** of water;
allow suggestion based on alloys being less prone to rusting; — 2max

(d) (iron + sulphuric acid →) iron sulphate + hydrogen;; — 2

2(a) increase magnetic field;
more coils;
increase current; — 2max

(b) reverse current; — 1

(c) electricity to motion; — 1

(d)(i) R = V/I;
= 6;
Ω; 3

(ii) power input = V x I;
= 3 x ? so W = 0.5 x 3 = 1.5 W; 2

(e) work = force x distance or 50N x 0.1 = 5J;
power = work / time;
= 0.5 W; 3

(f) motor will not be efficient / energy lost;
a suggestion as to where energy is lost ; 2

3(a)(i) retina/receptor cells/rods/cones; 1

(ii) cornea;
lens;
aqueous/vitreous humour; 2 max

(b) light rays reach that point/ you could produce image on a screen; 1

(c)(i) brown;
blue;
B and b;
b; (accept if written twice);
Bb and bb; (accept if each written twice) 5

(ii) 1:1; 1

| | | |
|---|---|---|
| 4(a)(i) | erosion/weathering; | 1 |
| (ii) | wind blows sand;<br>sand hits rock breaking small pieces from it;<br>other reasonable e.g. freeze-thaw;<br>other reasonable explanation; | 2max |
| (iii) | weathering processes / geological processes usually much longer than human life-time; | 1 |
| (b)(i) | sulphur dioxide / carbon dioxide / nitrogen dioxide; | 1 |
| (ii) | increase in temperature;<br>increase in the rain acidity;<br>if rock is more weathered surface area of rock increased; | 2max |
| (c) | humus / organic material;<br>reference to fertiliser / named fertiliser;<br>reference to mineral / named mineral;<br>water; | 2max |
| 5(a)(i) | gravity;<br>air resistance/ friction; | 2 |
| (ii) | force of gravity balances air resistance/friction; | 1 |
| (b) | $KE = 1/2\ mv^2$;<br>$= 1/2 \times 0.1/1000 \times 2 \times 2$ ;<br>$= 0.0002$ J; | 3 |
| (c)(i) | light bends / changes speed<br>(when travelling from one medium/material to another); | 1 |
| (ii) | red least and<br>violet most; | 1 |

| | | |
|---|---|---|
| 6(a) | cell wall;<br>(large) vacuole; | 2 |
| (b) | line labelled P, touching inner of two lines surrounding the cell; | 1 |
| (c) | molecules;<br>greater;<br>osmosis; | 3 |
| (d) | transpiration;<br>exerts a 'pull';<br>pressure higher at bottom than top of xylem vessels/ cohesion; | 2 max |
| 7(a)(i) | gas produced;<br>temperature has increased/ exothermic reaction;<br>no solid remains; | 3 |
| (ii) | acid; | 1 |
| (b)(i) | allow any two metallic physical properties;; | 2 |
| (ii) | strontium hydroxide / hydrogen; | 1 |
| 8(a)(i) | ethanol; | 1 |
| (ii) | emulsion/colloid; | 1 |

| | | |
|---|---|---|
| (b)(i) | digests them/breaks them down;<br>to glycerol **and** fatty acids; | 2 |
| (ii) | (fatty) acids produced; | 1 |
| (iii) | reaction happening more slowly; | 1 |
| (iv) | enzyme denatured/damaged / destroyed;<br>reaction not taking place; | 2 |
| 9(a) | A calcium;<br>B sulphate;<br>C chloride;<br>D nitrate; | 4 |
| (b) (i) | little or no lather / much soap needed for lather;<br>scum; | 2 |
| (ii) | A; | 1 |
| (c) | chlorination / using ozone/ boiling; | 1 |
| 10(a)(i) | X; | 1 |
| (ii) | U/V; | 1 |
| (iii) | W; | 1 |

| | | |
|---|---|---|
| (b)(i) | heel raised from ground; | 1 |
| (ii) | Z; | 1 |
| (c) | cartilage (covers ends of bones);<br>synovial fluid (between them);<br>lubrication; | 2 |
| (d) | respiration;<br>oxygen combined with glucose;<br>ATP formed; | 2 max |
| 11(a) | sound;<br>electrical;<br>loudspeaker;<br>vibrations; | 4 |
| (b) | indication of 'height' of wave;<br>from peak to trough/2; | 2 |
| (c)(i) | electrons; | 1 |
| (ii) | negative; | 1 |
| (d)(i) | red blue and green ;;<br>three right = 2 marks<br>two right = 1 mark | 2 |
| (ii) | wavelength / frequency; | 1 |