MARK SCHEME for the May/June 2010 question paper

for the guidance of teachers

0653 COMBINED SCIENCE

0653/63   Paper 63 (Alternative to Practical), maximum raw mark 60

1 (a) Length of leaves / mm

Leaf No	Length	Leaf no	Length		
1	39	11	45		
2	48	12	42		
3	55	13	49		
4	43	14	50		
5	36	15	34		
6	47	16	32		
7	39	17	44		
8	51	28	35		
9	53	29	34		
10	35	20	39	;;	[2]

(b) correct method of working (e.g. 856/20 =) ;
correct answer inside range 40.8 – 44.8 ;   [2]

(c) (i) correct numbers entered e.g. 3, 6, 3, 4, 2, 2 ;
numbers add to 20 ;   [2]

(ii) suitable scale and label on vertical axis ;
ranges labelled on bars of equal width ;
correct heights of bars ;   [3]

(d) any suitable factor, e.g. variation in light intensity / carbon dioxide concentration /
water minerals / temperature ;   [1]

                                                                    [Total: 10]

2 (a) (i) no colour ;   [1]

(ii) calcium chloride ;   [1]

(b) (i) method **A**   [1]

(ii) EITHER
method **B** because ammonia is lighter (less dense) than air ;
or
method **C** because ammonia is soluble in (reacts with) water ;   [max 1]

(c) (i) zinc (Zn) ;   [1]

(ii) (light) blue colour ;
dark (deep) blue (both essential) ;   [2]

(iii) (red to) blue ;   [1]

(d) ammonia gas reacts with hydrogen chloride gas ;
(solid) ammonium chloride (NH_4Cl) is formed ;
or
equation given with **all** state symbols ;   [max 2]

[Total: 10]

3 **(a)** **(i)** 21.9 g and 23.1 g (exact) ;;   [2]

   (ii) 23.1 – 21.9 = 1.2 g (ecf) ;   [1]

(b) **(i)** process **A** = evaporation / evaporating ;   [1]

   (ii) process **B** = condensation / condensing ;   [1]

(c) **(i)** 1.2 cm^3 (ecf) ;   [1]

   (ii) volume of steam from 1 cm^3 water = $\dfrac{2000 \times 1}{1.2}$ (ecf) ;

   = 1667 cm^3 (1670) ;   [2]

(d) steam has a much greater volume than the water/water expands when it becomes
steam ;
expansion causes a force / the particles of steam have a large kinetic energy /
OWTTE ;   [2]

[Total: 10]

4 **(a)** gas jar filled with water ;
displace water by blowing into jar ;   [max 2]
blow through tube into a gas-jar ; (gas-jar must **not** be stoppered) (award 1 only)

(b) **(i)** inhaled air 7.5 s ;
exhaled air 5.5 s ;   [2]

   (ii) 7.0 s ;   [1]
5.0 s ; (award 1 mark for '7' and '5')   [1]

(c) **(i)** goes milky / cloudy ;   [1]

   (ii) respiration ;   [1]

   (iii) before exercise 8.4 s and after exercise 3.2 s ;   [1]

   (iv) increased respiration rate (during exercise) ;   [1]

[Total: 10]

5 **(a)** 62 cm^3, 45 cm^3, 6 cm^3 (no tolerance) ;;;   [3]

    (b) concentration = 1.2, 0.8, 0.4 (no tolerance) all 3 correct ;
           correctly recorded in Table 5.1 ;   [1]

    (c) at least one axis correctly labelled and suitable scales chosen ;
           all points correctly plotted, (± 1 cm^3 and 0.05 mol / dm^3) ;
           suitable straight line drawn ;   [3]

    (d) **(i)** same mass of magnesium (NOT same amount) ;
                same surface area of magnesium ;   [2]

          (ii) volume of hydrogen given off is **proportional to** the concentration
                of the hydrochloric acid. (Words in heavy type must be used.) ;   [1]

                                                                             [Total: 10]

6 **(a)** mass of can = 29 g (no tolerance) ;
          t_2 = 70 °C (no tolerance) ;
          t_3 = 66 °C (no tolerance) ;
          volume of water = 42 cm^3 (no tolerance) ;   [4]

    (b) **(i)** (t_3 – 25 =) 66 – 25 = 41 °C ;   [1]

          (ii) 70 – 66 = 4 °C ;   [1]

          (iii) specific heat = $\dfrac{4 \times 42 \times 4.2}{41 \times 29}$;
                 = 0.59 (accept 0.6) ;   [2]

    (c) current in amps ;
           time in seconds **or** minutes ;   [2]
           (the order of the answers is not important)
           (Allow 'power (energy used) in watts' **instead of** current in amps.)
           ('Time in seconds or minutes' must be **one** of the answers for two marks to be awarded.)

                                                                            [Total: 10]