CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0654 CO-ORDINATED SCIENCES

0654/62 Paper 6 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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1 **(a)** **(i)** length of holly leaf measured as 68 to 69 ;
magnification = ×1.5 ;

(ii) holly leaf has branched veins / grass has parallel veins ;
holly leaf has spikes ;
grass leaf relatively longer / narrower ;
grass leaf does not have a stalk ;
any other correct **visible** comparative (not thick / thin) ; [max 2]

(b) **(i)** faster diffusion of CO_2 / CO_2 present inside leaf ; [1]

(ii) (more) stomata/pores on lower surface ; [1]

(iii) lower surface less exposed to sun / heat ;
so less transpiration / evaporation / water loss ; [2]

(vi) grass leaf shows bubbling from both surfaces / ORA ;
because stomata / pores both on upper and lower surfaces ; [2]

[Total: 10]

2 **(a)** **(i)** 35 degrees ;
50 degrees ; [2]

(ii) 0.57 ;
0.77 ; [2]

(b) **(i)** points correctly plotted ± half square (allow 1 error);
straight line drawn (line crosses at 100 max 2);
extending to sine $\theta = 1.00$; [3]

(ii) mass = 104 g (or as candidate's graph) ; [1]

(iii) friction ; [1]

(c) (the results should be the same) because gravity acts equally (on all three masses) ; [1]

[Total: 10]

3 **(a)** *observations*: bubbling is seen ;
gas pops ;
conclusion: hydrogen ; [3]

(b) red **OR** red-brown **OR** brown ; (reject yellow) [1]

(c) **(i)** green ; [1]

(ii) *observation*: green ;
conclusion: iron(II) hydroxide ;

(d) white precipitate ; [1]

(e) magnesium, zinc ; [1]

(f) $FeCl_3$; [1]

[Total: 10]

4 **(a)** **(i)** (dark colours) would interfere with ability to see colour change / owtte ; [1]

(ii) flower **C** because anthers / stigma / are long or hanging outside plant / feathery stigma / pollen easily blown ; [1]

(b) **(i)** grind up flower with water ;
filter or decant (to separate extract from flower material) ;
(add Benedict's solution to extract) heat in hot water bath ; [3]

(ii) same volume of water ;
mass (etc) of flowers ;
volume of Benedicts solution ;
same heating ; [max 2]

(iii) **C B D A** ; [1]

(c) e.g.
either
slide 1 wind-pollinated (no mark)
feature small ;
importance (and easy to be) carried by wind ;
or
slide 2 insect pollinated (no mark)
feature sculptured surface ;
importance helps pollen to attach to insect ; [max 2]

[Total: 10]

5 **(a)** 30° = 13, 42° = 26, 49° = 37 (all 3 for 1 mark) ; [1]

(b) suitable scale chosen, both axes labelled ;
all points plotted correctly (half square tolerance) ;
curve drawn ; [3]

(c) (i) the bubbles will come too quickly for the marks to be made (accurately) ;

(ii) particles have more energy / move faster ;
more (effective) collisions (per unit time) ; [

(d) (i) carbon dioxide (or carbonic acid) + calcium hydroxide → calcium carbonate + water ;;
(all four correctly named 2 marks ; two or three correctly named 1 mark) [max 2]

(ii) calcium carbonate is insoluble in water ; [1]

[Total: 10]

6 (a) (i) 113.6 g ; [1]

(ii) 37.8 g ; [1]

(b) (i) 91 cm^3 ; [1]

(ii) 41 cm^3 ; [1]

(c) density = mass / volume or 37.8 / 41;
= 0.9(2) g / cm^3 (ecf) ; [2]

(d) hexane is not as dense as ice ;
hexane melts at a temperature lower than –5 °C ;
hexane does not dissolve / react with ice ; [max 2]

(e) (i) ice floats on the surface **AND** the polar bears can walk on it / so that fish can live under the ice / other suitable answer ; [1]

(ii) the polar ice may melt **AND** the habitat of the polar bear will be destroyed / they may drown / other suitable answer ; [1]

[Total: 10]