UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0653 COMBINED SCIENCE

0653/63 Paper 6 (Alternative to Practical), maximum raw mark 60

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International Examinations

1 **(a)** tube **A** 41 °C ;
tube **B** 32 °C ; [2]

(b) **(i)** tube **A** 14 °C
tube **B** 23 °C
tube **C** 12 °C
tube **D** 17 °C
(4 correct temperatures 2 marks, 3 correct 1 mark) [2]

(ii) tube **A** 2.8 °C / min
tube **B** 4.6 °C / min
tube **C** 2.4 °C / min
tube **D** 3.4 °C / min
(4 correct averages 2 marks, 3 correct 1 mark) [2]

(c) **(i)** heat (energy) transferred to / used by cold test-tubes / owtte ; [1]

(ii) control / to see what would happen with no covering ; [1]

(d) sweating speeds up heat loss (ora) / cools down quicker ;
(heat transferred to water) by conduction / evaporation ; [2]

[Total: 10]

2 **(a)** **(i)** magnet ; [1]

(ii) (labelled diagram)
funnel and paper ;
at least two labels ; [2]

(iii) evaporate (<u>not</u> to dryness) (to concentrate) ;
leave to dry / dab dry with filter paper / dessicator ; [2]

(b) **(i)** (acidified) barium chloride / barium nitrate (solution) ;
white precipitate / solid (allow ppt) ; [2]

(ii) sodium hydroxide (soln) ;
white ppt, soluble in excess / owtte ; [2]

(c) lead sulfate is insoluble ; [1]

[Total: 10]

3 **(a)** rheostat / variable resistor ; [1]

(b) 0.35, 0.48 ; (+/– 0.1) [2]

(c) **(i)** scales correct and at least one axis fully labelled ;
points correct ;;
straight line ; [4]

(ii) proportional / linear ; [1]

(d) circuit broken / wire melted / ammeter broken / owtte ; [1]

(e) decreases / goes down ; [1]

[Total: 10]

4 **(a)** change in mass 0.3, 0.1, 0.1, 0.3, 0.5 ; (all)
correct arithmetic sign ; [2]

(b) correct use of +ve and –ve values in plotting ;
correct plotting (allow ecf) ;
line of best fit drawn ; [3]

(c) value of 0.15 M or correct reading from graph ; [1]

(d) **(i)** any **one** suitable, e.g. not all potato exactly same mass / not all water removed for weighing / variation in temperature / variation in potato tissue / surface area different etc. ; [max 1]

(ii) make potato exactly 5.0 g / blot pieces carefully / maintain external temperature ; [max 1]

(e) red cells would burst / solution would become red ;
animal cells do not have a cell wall / plant cells have a cell wall to prevent bursting ; [2]

[Total: 10]

5 **(a)** 375 ;
510 ; [2]

(b) bubbles / effervescence makes it cloudy / test-tube opaque ; [1]

(c) marble (left in the test-tube at end) ; [1]

(d) **(i)** points (all 4 = 2 marks, 3 = 1 mark) ;;
line of best fit (**not** point to point) ; [3]

(ii) 1.15 mol / dm^3 / from students graph ; [1]

(e) line (labelled **T**) below original ; [1]

(f) any sensible answer, e.g. difference in shape or size or mass of marble / difficulty of judging when test-tube is clear ; [max 1]

[Total: 10]

6 **(a)** **(i)** 39.0, 25.5 ; [2]

(ii) 35.0, 23.0 ; [2]

(iii) 4.0, 2.5 (ecf) (**penalise** lack of .0 once **only**) [1]

(b) indication of working on the graph ;
gradient = 0.13 ; [2]

(c) fill container with water ;
immerse dog ;
fill measuring cylinder to known vol. ;
pour displaced water into measuring cylinder ;
remove dog and refill from measuring cylinder ;
record / calculate volume used ; [max 3]

[Total: 10]