

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0653 COMBINED SCIENCE

0653/61

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) 39.0 ; [1]
- (b) vertical line from top of foam and bottom of test-tube to ruler ; [1]
- (c) at least 4 correct plots ± 0.5 mm for **A** ;
 at least 4 correct plots ± 0.5 mm for **B** ;
 best fit line for **A** and labelled **A** and from 0 to 10 mins ;
 best fit line for **B** and labelled **B** and from 0 to 10 mins ; [4]
- (d) different temperatures (water baths) ;
 named condition or all other conditions constant ;
 record minimum temperature (above 40 °C) that gives no foam ;
 no temperature below 40 °C / investigate intermediate values ; [4]
- [Total: 10]**
- 2 (a) image shows filter paper and collecting vessel ;
 filtrate and residue labelled in correct places ; [2]
- (b) white precipitate / solid / deposit ;
 which dissolves / (colourless) solution formed (when more ammonia is added) ; [2]
- (c) (i) (pass gas into) limewater ;
 (to give) white precipitate / milky / cloudy / solid ; [2]
- (ii) (light) blue **AND** precipitate / solid ;
 (re-dissolves to give) dark blue solution ; [2]
- (d) brown / yellow solution ;
 brown / red-brown precipitate ;
OR
 brown / red-brown precipitate ;
 insoluble in excess ; [max 2]
- [Total: 10]**

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- 3 (a) 0.5 ;
0.8 ; [2]
- (b) (0.5/0.32 =) 1.6 ; (ecf)
(0.8/0.32 =) 2.5 ; (ecf) [2]
- (c) (i) linear scales, vertical 0 to 6 AND horizontal 0 to 120, **AND both** axes correctly labelled with variable AND at least one with a unit ;
4 out of 5 points plotted correctly $\pm \frac{1}{2}$ square ;
straight line drawn must pass through $0,0 \pm \frac{1}{2}$ square ; [3]
- (ii) resistance is proportional/directly proportional to length ; [1]
- (d) the wire heats up (and so change the resistance) ; [1]
- (e) resistance will be lower/current will be greater ; [1]
- [Total: 10]**
- 4 (a) take in a deep breath/fill lungs with air ;
exhale/blow into the tubing ;
air displaces water in the bell jar/air goes into bell jar/water level goes down ;
measure volume of air (inside bell jar) ; [max 3]
- (b) repeat ;
see if they are close together/compare results/check consistency/to confirm results ; [2]
- (c) (i) select students of different heights ;
measure their vital capacity/measure volume ;
one factor controlled ; [max 2]
- (ii) graph of height verses vital capacity/table in rank order of more than two people ; [1]
- (d) candle goes out more quickly with exhaled air/ORA ;
contains less oxygen/more carbon dioxide ; [2]
- [Total: 10]**

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- 5 (a) (i) temperature is constant / stops increasing ; [1]
- (ii) (all) intermolecular forces broken / change from liquid to gas ;
caused by thermal energy / as thermal energy absorbed ; [2]
- (iii) 118 °C ; [1]
- (iv) molecules lose energy ;
AND any 1 from:
intermolecular forces form ;
get stronger ;
molecules get closer together ;
turn to a liquid ; [max 2]
- (b) (i) solid / crystals appear ; [1]
- (ii) 16.5 ; [1]
- (iii) (thermal) energy is given out ;
AND any 1 from:
stops the temperature falling ;
strengthens / more intermolecular forces ; [max 2]
- [Total: 10]**
- 6 (a) (i) 9.9 **AND** 13.2 ; [1]
- (ii) 6.5 **AND** 9.9 ; (ecf) [1]
- (iii) 3.4 ;
3.3 ; (ecf) [2]
- (b) (i) $9.8 \times \frac{3.3^2}{2}$;
= 53.4 ; [2]
- (ii) errors ;
either:
errors evened out / decreased effect of errors ;
or
increases reliability ; [max 2]
- (c) hear at same time / sound arrives at same time ;
drop and timer happen together ;
OR
sound takes time to travel (from **A** to **B**) ;
timer started late / time too small / drop before timer started ; [max 2]
- [Total: 10]**