

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International Advanced Subsidiary Level

MARK SCHEME for the October/November 2014 series

8780 PHYSICAL SCIENCE

8780/04

Paper 4 (Advanced Practical Skills), maximum raw mark 30

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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge International AS Level – October/November 2014	8780	04

- 1 (a) current reading (no mark)
- (b) (i) table headings with correct units: R/Ω ; I/A ; $1/I/A^{-1}$ [1]
accept brackets instead of /
accept words instead of symbols
- (ii) record first values of R and I in table (no mark)
- (iii) 8 sets of readings recorded in table [1]
all readings of I made to nearest 0.01 A and consistent [1]
significant figures for $1/I$ to the same number as for I and consistent [1]
accept one more significant figure for $1/I$ than given for I
from graph: 6 points (not $R = 25\Omega$) within $1/I = 0.2$ of line [1]
- (iv) calculation of $1/I$ correct for each measurement of I [1] [6]
- (c) (i) graph: both axes labelled with sensible scales and at least $\frac{1}{2}$ grid used [1]
do not accept awkward scales – 3, 7, etc.
at least 7 points plotted to within $\pm \frac{1}{2}$ small square [1]
best straight line drawn [1]
- (ii) correct substitution into gradient formula and triangle used over at least $\frac{1}{2}$ drawn line [1]
- (iii) correct read-off of intercept and reciprocal [1] [5]
- (d) use of $E = 1/\text{gradient}$ [1] [1]
expect 5.4 V to 6.5 V
unit required (accept $A\Omega$)
accept a method using readings from the graph substituted in the equation
- (e)(i)(ii) correct identification of odd resistor network [1]
- (iii) correct value of odd resistor [1]
explanation of how sections of network were tested to identify odd resistor [1] [3]
OR
by calculation

[Total: 15]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge International AS Level – October/November 2014	8780	04

- 2 (a) silver nitrate and no/very faint precipitate [1]
do not allow addition of aqueous ammonia before the silver nitrate
- barium nitrate/chloride and white precipitate [1] [2]
accept a named soluble lead salt for the reagent
- (b) (i) green/greenish precipitate [1]
*turns brown (on heating/standing) [1]
correct test for ammonia with litmus or indicator paper [1]
- (ii) dark blue precipitate/colouration/solution [1]
- (iii) solution turns brown/brownish-yellow/yellow [1]
- (iv) brown/dark brown/brown-red precipitate [1]
- (v) turns blue/dark blue [1]
- (vi) solution turns yellow/yellow green [1]
- (vii) greenish/green precipitate [1]
*turns brown (on heating/standing) [1]
- (viii) blue precipitate/colouration/solution [1] [7]

*this mark can be awarded in EITHER (b)(i) or (b)(vii) but NOT both

MAXIMUM 7 MARKS FOR PART (b)
- (c) (i) iron(II) with correct evidence [1]
ammonium with correct evidence [1]
sulfate with correct evidence [1]
- (ii) hydrogen peroxide is an oxidising agent with correct evidence [1]

zinc is a reducing agent with correct evidence [1]
allow one mark if BOTH oxidising and reducing agents identified with no or incomplete evidence
- (iii) (iron(II) changes to iron(III) by air oxidation [1] [6]

[Total: 15]