

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

Cambridge International General Certificate of Secondary Education

## **MARK SCHEME for the October/November 2015 series**

### **0652 PHYSICAL SCIENCE**

**0652/51**

Paper 5 (Practical Test), maximum raw mark 30

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- 1 (a) (i) value of time greater than or equal to 10 s ; [1]  
*(allow: answers in minutes and seconds)*
- (ii) value within 10% of first value ; [2]  
both values to nearest second ;
- (b) (i)  $\text{Fe}^{2+}$  value less than both values in (a) ; [1]
- (ii)  $\text{Fe}^{3+}$  value less than both values in (a), **AND** to nearest second ; [1]
- (iii)  $\text{X}^{2+}$  value less than or equal to 5 s /  $\text{X}^{2+}$  value is 'instant' ; [1]
- (c) (i) at least **four**  $\frac{1}{t}$  values calculated correctly (*ignore s.f.*) ; [1]  
*(if  $t = 0$  allow  $\frac{1}{t}$  to be left blank or infinity but do **not** allow zero)*
- (ii) they are catalysts ;  
 $\frac{1}{t}$  (rate) increased (with addition of metal ion) / time decreased (with addition of metal ion) ; [2]
- (d) reliable as within 10% (or other suitable percentage or comment)  
**OR**  
not reliable as greater than 10% difference (or other suitable percentage or comment) ; [1]  
*(answer must demonstrate an understanding of reliability)*  
*(ignore: references to accuracy)*
- (e) (i) add 1 cm<sup>3</sup> water / add 5 drops + 1 cm<sup>3</sup> starch ;  
*(do **NOT** allow: 0.5 cm<sup>3</sup> more of **A** and 0.5 cm<sup>3</sup> more of **B**)*  
total volume should be same as in (b) / equivalent volume to metal ion / to keep concentrations the same ; [2]  
*(mark independently)*
- (ii) ppt. / white ppt. / cream ppt. / instant blue-black / instant reaction / more brown ; [1]
- (f) blue ppt. / dark blue solution ;  
**X** is copper / Cu (*depends on blue in first marking point*) ; [2]  
*(allow:  $\text{Cu}^{2+}$  or copper(II) for second marking point)*

[Total: 15]

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- 3 (a) ***h AND D AND d*** recorded ;  
*h > D > d* ;  
 all values to the nearest 0.1 cm ;  
*d<sub>A</sub>* calculation correct ;  
*V* calculation correct ;  
*V* given as whole number ; [6]
- (b) (i) *V<sub>w</sub>* correctly calculated with working shown, e.g. subtraction of two values ;  
*V<sub>w</sub>* is supervisor's value  $\pm 20 \text{ cm}^3$  (*can get this accuracy mark without calculation*) ; [2]
- (ii) cup not completely full / measuring cylinder not read at eye level / measuring cylinder not read perpendicularly / measuring cylinder not read from bottom of meniscus / water spilled on transfer / *R*<sub>2</sub> off scale of measuring cylinder ; [max 1]
- (iii) *V<sub>w</sub>* since difficult to measure *h* / *V<sub>w</sub>* since *d* (or *D*) not inside diameters / *V<sub>w</sub>* since it is a direct measurement / *V<sub>w</sub>* since *V* is an approximation / *V<sub>w</sub>* is actual measurement whereas *V* uses a formula ; [max 1]
- (c) (i) evidence of at least 2 loops of string around cup ;  
*(this could be in words or from diagram and could be in different positions or one position repeated)*  
 correct averaging of two or more measurements for value of *C* ;  
 answer to 0.1 cm (*independent mark*) ; [3]
- (ii) diagram showing correct positioning of one loop, e.g. half way up / at top / at bottom ; [1]
- (iii) calculation correct to 2 or 3 s.f. ; [1]

[Total: 15]