UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

0653 COMBINED SCIENCES

0653/51 Paper 5 (Practical Test), maximum raw mark 30

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International Examinations

1 (a) (i) splint relights / splint glows brighter ;
oxygen / O_2 ; [2]
(the second mark is tied to a correct observation being given)

(ii) 3 reasonably similar readings for fresh yeast **B**, **C** and **D** ;
clearly in seconds ; [2]

(iii) correct value for (**B** + **C** + **D**) ÷ 3 to a minimum of 1 decimal place unless it is exactly a whole number ; [1]

(b) (i) 'no reaction' recorded for **E** in Table 1.1 ; [1]

(ii) fresh yeast faster reaction / fresh yeast worked (or reverse statement) ;
enzymes (or yeast) denatured (killed / destroyed / made inactive) by boiling ; [2]

(c) (i) *yes*: similar readings ;
OR
no: different values / too few repeats / difficult to time end point (if this response is seen here it cannot be credited in **(c) (ii)** as well) / loss of yeast down side of tube ;
[max 1]

(ii) uneven concentration of yeast ;
timing error ;
judgement of foam reaching the line ;
not all yeast reaches the peroxide ;
detergent not controlled ;
concentration of hydrogen peroxide ;
accuracy of measuring (must be accompanied by reference to scale) ; [max 1]

[Total: 10]

2 (a)

compound changes	name and formula	time / s	colour
A	zinc carbonate, $ZnCO_3$	e.g. 31	yellow (when hot)
B	magnesium carbonate, $MgCO_3$	e.g. 21	(remains) white
C	unknown metal carbonate, **X**CO_3	e.g. 28	(green to) black

(ii) **A**: a value of time (in seconds) **AND** yellow / yellow when hot (ignore references to the limewater) ; [1]

(iii) **B**: a value of time **AND** white / no change / same (ignore references to the limewater) ;
C: a value of time **AND** black (ignore references to the limewater) ; [2]

(iv) 1 (fastest) = one with shortest time
2 = one with intermediate time
3 (slowest) = one with longest time ; [1]
(note: this must be consistent with candidates' results)

(v) carbon dioxide / CO_2 ; [1]

(b) (i) blue ppt. / grey-blue ppt. / green-blue ppt. ; [1]

(ii) brown / black solid **OR** zinc turns brown / black ;
bubbles / effervescence / colourless solution / solution less blue / gets hot ; [2]

(iii) **X** = copper / Cu ; (note: do **not** allow copper(II) / Cu^{2+}) [1]

evidence 1 and **evidence 2:**
<u>any two for one mark</u>
blue ppt. with NaOH (in **(c)(ii)**) **and** / **or** blue solution in **(c)** ;
copper carbonate is green ;
copper oxide is black ;
brown solid (in **(c)(ii)**) ;
displacement by zinc gives brown solid ;
X is brown ;
X does not react with acid ; [max 1]

[Total: 10]

3 (a) any five readings (allow full reading from clock) ;
any complete column of readings (allow full reading from clock) ;
all 15 readings entered (allow full reading from clock) ;
average of readings increasing from θ = 10° to 30° ;
all readings recorded to 0.1 s ; [5]

(b) (i) all 3 averages correctly calculated to at least 1 decimal place ; [1]

(ii) all 3 **T** values calculated correctly to at least 1 decimal place (average ÷ 10) ; [1]

(c) use of $\boldsymbol{l}$ = 0.30 m ;
correct calculation of **g** to at least 1 decimal place using correct **T** from table which must be squared ; [2]

(d) any errors are reduced (divided by ten) / reduced effect of timing error ; [1]

[Total: 10]