CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the May/June 2015 series

0654 CO-ORDINATED SCIENCES

0654/63 Paper 6 (Alternative to Practical), maximum raw mark 60

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CAMBRIDGE
International Examinations

1 **(a)** yeast dead / (enzyme) no longer active / denatured ; [1]

(b)

time / mins	colour in tube **A**	colour in tube **B**	colour in tube **C**
1	blue	blue	blue
2	**colourless**	**blue**	**blue**
3	**colourless**	**blue**	**blue**
4	**colourless**	**blue**	**blue**
5	**colourless**	**colourless**	**blue**
6	**colourless**	**colourless**	**blue**

time / mins ;
A correct ;
B correct ;
C correct ;

ALLOW decolourised IGNORE transparent [4]

(c) **(i)** constant volume / concentration ; [1]

(ii) A changes quicker / changes first / respires faster ;
(more) glucose / substrate available in A ; [2]

M2 dependent on times being considered

(d) (colour changes back to) blue ;
methylene blue oxidised / reacts with oxygen / oxygen introduced ;
oxygen from air above solution ; [max2]

[Total: 10]

2 **(a)** make a solution in water ;
add (aqueous) sodium hydroxide / (aqueous) ammonia ;
green (gelatinous) ppt / solid ; [3]

(b) add sodium hydroxide (solution) and heat ;
damp ;
(red) litmus turns blue ; [3]

(c) make a solution in water ;
add hydrochloric / nitric acid ;
add barium chloride / nitrate (solution) ;
white ppt ; [4]

[Total: 10]

3 **(a)** correct symbol for voltmeter ;
connected in parallel between **X** and **Y** or equivalent ; [2]

(b) **(i)** values in table: [2]
1.81 ; ALLOW range 1.80 – 1.82
0.7**0** ;

(ii) headings: V, A, Ω (all three required) ; [1]

(iii) 3.91, 8.00, 2.59 (allow ecf on third value)
all values to 2 d.p ;
all correct values ; [2]

(c) use of 3.91 and 2.59 ;
statement matches results (expect NO)
AND
justification: e.g. values are too different / not close enough, even allowing for experimental error / is 1.5 times ; [2]

(d) the lamps are at different temperatures / lamps have different resistances or currents than expected / this could explain why teacher statement not supported ; [1]

[Total: 10]

4 **(a)** **(i)** 61 ; [1]

(ii) 433 ; [1]

(iii) 0.0023 ; [1]

(b) **(i)** Correct plotting (allow 1 error) ;
SMOOTH curve ; [2]

(ii) 52 ± 2 ; [1]

(iii) Do not know the rate either side of 52 °C / need more results in range e.g. 40 °C to 60 °C ; [1]

(c) repeat experiment with water instead of acid ;
1 cm^3 ;
solution will remain cloudy ; [3]

[Total: 10]

5 **(a)** **(i)** lamp / bulb / ammeter ; [1]

(ii) correct symbol for cell (or battery) ; [1]

(iii) (explanation) does not react ;
(material) e.g. carbon / platinum ; [2]

(b) **(i)** gives red-brown ppt ; [1]

(ii) damp litmus ;
(red then) bleached ; [2]

(iii) hydrogen ;
lit splint ;
"pops" ; [3]

[Total: 10]

6 **(a)** **(i)** 21.5 ; 20.5 ; [2]

(ii) axes correct and labelled ;
vertical axis NOT starting at zero ;
points correct (allow 1 error) ; (e.c.f. from part **(i)**) [3]

(iii) no, points scattered / no pattern / no straight line ; (e.c.f. from parts **(i)** and **(ii)**)
(ignore any line drawn) [1]

(b) (any **three** of)
rods should be same length and width ;
amount of wax should be the same ;
experiment repeated and average taken ;
water should be stirred ; [3]

(c) (answer depends upon **(b)**)
keep thickness / length (etc.) means only variable is % magnesium ;
repeating identifies anomalous results ; [1]

[Total: 10]