UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the November 2005 question paper

0653/0654 COMBINED SCIENCE/CO-ORDINATED SCIENCES

0653/06, 0654/06 Paper 6 (Alternative to Practical), maximum raw mark 60

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

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Question 1

(a)(i) Add Benedict's solution / Fehlings test (1)
Warm / boil the mixture (1) **[2]**

(ii) line 1;starch present (1)
line 2; blue (NOT blue-black) (1) **[2]**

(b)(i) green/yellow/red **[1]**

(ii) starch in seeds broken down/hydrolysed to sugar OWTTE (1)
by enzymes/amylases (1)
during germination (1)
to produce energy for the growing plant (1) (any 3) **[3]**

[Total 8 marks]

Question 2

(a)(i) 1.8, (must be in column 1) 0.6 (in any box) 1.2 (in any box) (no tolerance) **[3]**

(ii) any **two** A, B, C matched with the reading 1.2 (ecf)
any **one** of A, B, C matched with the reading 0.6 (ecf) **[2]**

(iii) R = V/I, 3/0.6 = 5 ohms. (ecf)
OR find the total resistance of 2 or 3 lamps using R = V/I and
appropriate values from Fig. 2.3 and divide by the number of lamps **[1]**

(b) all three lamps in series (1) with d.c. supply and one ammeter (1)
max 1 mark if only two lamps are shown in series
(no penalty if a switch is included) **[2]**

(c)(i) greater resistance (of whole series circuit) OWTTE
or smaller voltage drop across each lamp **[1]**

(ii) parallel circuit lamp(s) brighter than series lamp(s) OWTTE **[1]**

[Total 10 marks]

Question 3

(a)(i) 102.7 (no tolerance)

(ii) 98.4 (no tolerance)

(iii) 4.3 (ecf) (no tolerance) **[3]**

(b)(i) bubbling/hydrogen given off (1)

(ii) bubbling stops/no more hydrogen given off (1)

(iii) pink-brown-red (solid) (1) **[3]**

(c)(i) 101.5 (1) no tolerance

(ii) 101.5 – 98.4 = 3.1 (ecf) (1) **[2]**

(d) 3.1 x 100/4.3 (ecf) (1) = 72% (1) **[2]**

[Total 10 marks]

Question 4

(a)(i) pulse beats in 15s:22
beats per min: 132, 80 (no tolerance) **[3]**

(ii) points plotted correctly (2)
suitable curve drawn (1)
(–1 if unsuitable scale used) **[3]**

(iii) pulse rate decreases as time after exercise decreases OWTTE **[1]**

(b)(i) (heart rate increases) to get more blood to muscles/lungs (1)
to increase supply of oxygen/glucose (1)
to increase respiration rate /energy available to muscles (1)
(any 2) **[2]**

(ii) because of anaerobic respiration during exercise/get rid of lactic acid/repay oxygen debt **[1]**

(c) drink (measured amount of) coffee and repeat experiment (both necessary for 1 mark) compare results (using table or graph) (1) **[2]**

[Total 12 marks]

Question 5

(a)(ii) acid (gas) (1) OR gas cannot be ammonia

(iii) turned cloudy/milky or white precipitate (1) **[2]**

(b)(i) water (of crystallisation) given off (1) reject iron salt present

(ii) no oxygen (1)

(iv) turned red (1) **[3]**

(c) **(**heated) test-tube with solid; moist red litmus paper shown in mouth of tube, labelled. **[1]**

(d) light splint and blow out to leave glowing, hold (in mouth of the tube) in gas, splint rekindles (all points essential) **[1]**

(e) dissolve in water (essential) and add (aqueous) sodium hydroxide (or aqueous ammonia) (1)
green ppt (turning brown) = iron(II) (1)
brown ppt = iron(III) (1) **[3]**

[Total 10 marks]

Question 6

(a) 76 g, 44 g: 38 s, 36 s (no tolerance) **[4]**

(b) 1.90, 1.80 s (ecf) (both correct with second d.p.given) **[1]**

(c) axes correctly labelled and suitable scale chosen (1)
points plotted accurately (1)
best fit straight line drawn, (1) **[3]**

(d) no effect OWTTE **[1]**

(e) length of pendulum (string) increased, gravitational force changed, material of string changed (any one)
OR (if the answer refers to variation in data given)
inaccurate timing **[1]**

[Total 10 marks]