

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

International General Certificate of Secondary Education

**MARK SCHEME for the NOVEMBER 2004 question paper**

**0652 PHYSICAL SCIENCE**

**0652/06**

**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.

CIE is publishing the mark schemes for the November 2004 question papers for most IGCSE and GCE Advanced Level syllabuses.

**Grade thresholds** taken for Syllabus 0652 (Physical Science) in the November 2004 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 6	60	41	30	21	16

The threshold (minimum mark) for B is set halfway between those for Grades A and C.  
The threshold (minimum mark) for D is set halfway between those for Grades C and E.  
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.

Grade A\* does not exist at the level of an individual component.

November 2004

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 60

SYLLABUS/COMPONENT: 0652/06

PHYSICAL SCIENCE  
Paper 6 (Alternative to Practical)

Page 1	Mark Scheme	Syllabus
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- 1 (a) no change in mass (OWTTE) (1)  
matter has neither been created nor destroyed (1) [1]
- (b) a solid (suspension) produced from a solution OWTTE  
OR  
soluble substances (reacting) make an insoluble substance [1]
- (c) 1 white  
2 white (turning darker/blue)  
3 green (turning brown)  
(the changes of colour need not be mentioned) [3]
- (d) 1 barium sulphate; accept  $\text{BaSO}_4$   
2 silver chloride; accept  $\text{NaCl}$   
3 iron(II) hydroxide; accept  $\text{Fe}(\text{OH})_2$   
(reject: iron hydroxide)  
(the formulae must be correct to be credited) [3]
- (e) gas escapes (from the flask) so decreasing the mass [1]
- Total 10 marks**
- 2 (a) (i) 3.0, 1.0, no tolerance [2]  
(ii) 21, 110 no tolerance [2]
- (b) choice of scale, both axes labelled with units (1)  
all points plotted correctly  $\pm 2$  s,  $0.05 \text{ mol/dm}^3$  (e.c.f.) (1)  
smooth curve (1)  
(-1 mark if axes reversed)  
(do not penalise if scale begins at value greater than 0) [3]
- (c) approximately 32 s (from candidates' own graph  $\pm 2$  s) [1]
- (d) reaction vessel and delivery tube (1)  
suitable method of measuring volume, e.g. graduated tube over water, graduated syringe (1) [2]

**Total 10 marks**

Page 2	Mark Scheme	Syllabus
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- 3 (a) project a sharp image on the screen (OWTTE) (1)  
measure distance from lens to screen (1) [2]
- (b) 20, 35, 65, 80 in correct positions (-1 for each error) no tolerance [2]
- (c) smaller, inverted (1) same size, inverted (1) larger, inverted (1) [3]
- (d) (i),(ii),  
(iii) both light rays and image correctly drawn (1)  
(iv) 16 mm +/- 2 mm (e.c.f. on student's own diagram) (1) [2]
- (e) Experiment 3  
(accept this answer even if (d) incorrectly drawn) (1) [1]

**Total 10 marks**

- 4 (a) cold water  $22^{\circ} \pm 0.2^{\circ}$   
Experiment 1 final temperature  $37.5 \pm 0.2^{\circ}$   
Experiment 2 final temperature  $53.5 \pm 0.2^{\circ}$  [3]
- (b)  $37.5 - 22 = 15.5^{\circ}$  (e.c.f.)  
 $70 - 53.5 = 16.5^{\circ}$  (e.c.f.) [2]
- (c)  $4.2 \times 100 \times 15.5 = 6510 \text{ J}$  (e.c.f.) [1]
- (d)  $4.2 \times 100 \times 16.5 = 6930 \text{ J}$  (e.c.f.) [1]
- (e) the same mass (volume) of water each time (1)  
needs the same amount of heat exchanged (1)  
(reject: the hot water absorbs the heat from the cold water) [2]
- (f) prevent heat loss (using insulated containers)  
take into account heat gained by the containers  
weigh the water instead of measuring its volume  
use a more accurate thermometer  
repeat and find the average result (any 1)  
(reject "Repeat the experiment") [1]

**Total 10 marks**

Page 3	Mark Scheme	Syllabus
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- 5 (a) Experiment 1: no change; no; no (3)  
 Experiment 5: powder turned red or brown  
 OR  
 red glow; yes; no. (3) [6]
- (b) anhydrous copper sulphate (white) (1) turned blue (1)  
 OR  
 anhydrous cobalt chloride (blue) (1) turns pink (1)  
 OR  
 boiling point (1) is 100°C (1)  
 OR  
 freezing point (1) is 0°C (1) [2]
- (c) named substance undergoes oxidation by combining with oxygen (1)  
 named substance undergoes reduction by losing oxygen (1)  
 OR  
 explanation based on changes of oxidation number  
 OR  
 mention of electron loss (e.g. by hydrogen atoms) and gain (e.g. by copper ions)  
 explanations MUST refer to reactions from Fig. 5.2  
 (accept explanations based on two different reactions) [2]
- Total 10 marks**
6. (a) (i) (gravitational) potential (the word potential must be used) or kinetic  
 (ii) kinetic/motion  
 (iii) electrical [3]
- (b) current = 2.2 A,  
 voltage = 0.8 V, no tolerance [2]
- (c)  $5 \times 10 \times 1 = 50 \text{ J}$  (accept answer with no unit) [1]
- (d)  $2.2 \times 0.8 \times 10 = 17.6 \text{ J}$  e.c.f. from (b) (accept answer with no unit) [1]

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- (e) energy lost as heat because of friction (1)  
resistance of connecting wire (1)  
because the dynamo is not efficient (1)  
energy converted to sound or heat when the mass falls (1)  
(reject "heat lost from the bulb") (any 2) [2]
- (f) change of mass, voltage, current,  
time of falling, brighter bulb,  
(reject "pulley moves faster, greater energy exchange") (any 1) [1]

**Total 10 marks**