UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2008 question paper

0652 PHYSICAL SCIENCE

0652/02 Paper 2 (Core Theory), maximum raw mark 80

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began.

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.

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1 **(a)** **(i)** voltmeter in parallel with main circuit (1)
across the bulb (+1) [2]

(b) **(i)** 0.25A (1) [1]

(ii) use of $V = IR$ (1)
= 8.0 (1)
ohms (give this even if working incorrect) (1) [3]

(iii) resistance increases (1)
because the filament/bulb gets hot (1) [2]

[Total: 8]

2 **(a)** CH_4 covalent [2]
KBr ionic [2]

(b) sodium Na^+ [2]
chloride (not chlorine) Cl^- [2]

[Total: 8]

3 **(a)** **(i)** use of weight = mass × g (1)
= 2.0 N (1) [2]

(ii) 2.0 N OR consistent with **(i)** (1) [1]

(b) **(i)** arrow vertically upwards (allow without label if clear) (1) [1]

(ii) accelerate (1)
upwards (1) [2]

[Total: 6]

4 **(a)** halogens [1]

(b) 7 [1]

(c) $Cl_2 + 2NaBr \rightarrow Br_2 + 2NaCl$ [2]
(formulae – 1 mark: **then** correct balancing – 1 mark)

(d) iodine is less reactive (1)
than bromine (1) [2]
(accept bromine is more reactive than iodine for both marks)

(e) element in period 2 named (not chlorine) (1)
corresponding atomic number (1)
corresponding relative atomic mass (1) [3]
(give these last 2 marks even if the named element is not in the correct period)

[Total: 9]

5 **(a)** **(i)** mercury/alcohol (not ethanol) [1]

(ii) The liquid moves up the capillary tube (1)
because it expands (1) [2]

(iii) conduction [1]

(b) **(i)** 100 °C (accept 97–101) [1]

(ii) change (of state) from liquid to vapour/gas
without change in temperature
throughout the liquid/forms (vapour) bubbles ANY TWO (1 + 1) [2]

[Total: 7]

6 **(a)** **(i)** alcohols [1]

(ii) homologous [1]

(b) C_3H_7OH [1]

(c) correct structural formula including hydrogens [1]

(d) two correct uses (ANY TWO)
e.g. alcoholic drinks
fuel
solvent
etc. (1+1) [2]

[Total: 6]

7 **(a)** **(i)** waves change direction on entering shallow water (1)
refraction correct (1)
wavelength in deep water constant AND in shallow water (1) [3]
(If only 3 wavefronts drawn max. 2; 2 drawn max. 1)

(ii) refraction (1) [1]

(b) **(i)** clear reflected waves (1)
angle i = angle *r* (approx. by eye) (1)
wavelength equal throughout (1) [3]
(if only 3 wavefronts drawn max. 2; 2 drawn max. 1)

[Total: 7]

8 **(a)** **(i)** sodium most reactive (1)
gold least reactive (1) [2]

(ii) between iron and sodium/above iron/below sodium (1)
carbon removes oxygen from iron/carbon reduces iron ore/oxide (1) [2]

(b) hematite/magnetite/etc. [1]

(c) **(i)** alloy [1]

(ii) correct use e.g. cutlery/medical instruments/etc [1]

[Total: 7]

9 **(a)** **(i)** N&S labelled correctly [1]

(ii) like poles repel (1)
upward force = gravitational force (1) [2]

(b) Y attract, X attract (must have both) [1]

(c) iron bar would be magnetised (1)
one end would now repel (1) [2]

[Total: 6]

10 **(a)** oxidation [1]

(b) oxide [1]

(c) **(i)** 79 cm^3 (accept 80) [1]

(ii) nitrogen [1]

[Total: 4]

11 **(a)** electron (1)
fast/energetic/from the nucleus (1) [2]

(b) **(i)** nucleon numbers correct: 131, 0 (1)
proton numbers correct: 54, –1 (1) [2]

(ii) Xenon (1)
Nobel gas/inert (1) [2]

[Total: 6]

12 **(a)** 1 2 1 1 1 (accept correct multiples) [1]
(ones may be omitted)

(b) **(i)** carbon dioxide [1]

(ii) mention of limewater (1)
turns milky/cloudy/white precipitate (1) [2]
(must have carbon dioxide to score in this section)

(c) filter (1)
evaporate/boil/heat (+1) [2]

[Total: 6]