CAMBRIDGE INTERNATIONAL EXAMINATIONS
Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series
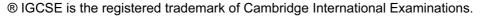

0652 PHYSICAL SCIENCE

0652/61   Paper 6 (Alternative to Practical), maximum raw mark 60

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, which would have considered the acceptability of alternative answers.

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1 **(a)** **(i)** (more) efficient (at condensing) ;
condenser always filled with water ;
cools vapour as soon as it enters condenser ;   [max 2]

(ii) vapour / it might (escape and) ignite (because of the proximity of the Bunsen burner) ;
toxic nature of escaping vapour ;   [2]

(b) ethanol 78 ;
hexane 69 ;
heptane 98 ;   [3]

(c) **(i)** the more C atoms / the larger the molecule / the longer the chain / down series the higher
the boiling point ;   [1]

(ii) boiling point quoted between 100 and 150 ;   [1]

(d) bpt pentanol higher than 100 / bpt water ;   [1]

[Total: 10]

2 **(a)** starch ;   [1]

(b) **(i)** burette / pipette / syringe ;   [1]
(ii) (dropping) pipette / syringe / burette / dropper ;
(must be different to the answer to **(b)(i)**)   [1]

(c) 57 ; 8 ; 4 ;   [3]

(d) Fe^{2+} (no mark)
because it caused a faster reaction / shorter time / faster ; [1]

(e) **(i)** copper ;   [1]

(ii) copper hydroxide ;   [1]

(f) Add $1\,cm^3$ water ;   1

[Total: 10]

3 **(a)** **(i)** h = 8.2 ; [1]

(ii) B = 4.6 ; [1]

(iii) T = 6.7 ; [1]

(iv) 4.6 + 6.7 = 11.3. 11.3 / 2 = 5.7 ; (ecf) ALLOW 5.65 [1]

(v) V = $\pi d^2 h / 4$ = 3.14 × 5.7^2 × 8.2 / 4 = 209 / 209.2 ; [1]

(b) **(i)** 55 ; [1]

(ii) V_2 = 250 – 55 = 195 ; [1]

(c) 1. the student cannot tell when the cup is "full" of water OWTTE ;
2. measuring cylinder / scale is not accurate / to 1 cm^3 ; Any two
3. air bubbles in the water ;
4. warmer / colder affecting density ; [2]

(d) Subtract the masses AND gives volume ;
OR
ALLOW subtract masses and divide by the density ; [1]

[Total: 10]

4 **(a)** 3.6 ; 2.2 ; 1.5 ; [3]

(b) variable resistor / rheostat ;
correct symbol ; [2]

(c) **(i)** X / 3.6
Y / 2.2 in this order ;
Z / 1.5 [1]

(ii) A higher potential difference (voltage) must be applied (to get the same current) to a
higher resistance OWTTE ; [1]

(d) resistance of X = 3.6 / 0.5 = 7.2 (ohms) ; [1]

(e) Wire 1 – X
Wire 2 – Y
Wire 3 – Z ;;

All correct 2 marks, 1 correct 1 mark [2]

[Total: 10]

5 (a) tube dips into water in suitable vessel ;   [1]

   (b) (i) (first signs of the) whiteness / milkiness / cloudiness ;   [1]

      (ii) 6.4 ; 7.7 ; 7.0 ;   [3]

      (iii) 7(.0) or 7.03 ;   [1]

   (c) 7.03 × 0.015 / 25 OR 7 × 0.015 / 25 OR 0.004218 / 0.004 / 0.0042 ;   [2]

   (d) litmus ;
       red to blue ;
       OR
       UI ;
       orange / yellow to green / blue / purple ;
       or other suitable indicator and correct colour change   [2]

                                                      [Total: 10]

6 (a) One student times the 1-metre run and the other times the 2-metre run ;
       OR
       One student releases and other times at 1 m and 2 m ;   [1]

   (b) 2.6 s AND 3.5 s recorded in correct place ;   [1]

   (c) (i) 1 / 3.5 = 0.29 (m / s) ;
          2 / 4.9 = 0.41 (m / s) OR 1 / 1.4 = 0.71 (m / s) (so must have accelerated) ;

          OR
          same distance (1m) ;
          in less time quoting 1.4 s ;

          OR
          acceleration correctly calculated ;   [2]

      (ii) height = 2 cm. average speed = 0.41 (m / s) ;
           height = 4 cm, average speed = 0.57 (m / s) ;
           height = 5 cm, average speed = 0.65 (m / s) ;   [max 2]

(d) since acceleration due to gravity is independent of mass ;
The results will be the same ;

OR
More friction ;
slower ;   [2]

(e) (speeds too great) difficult to measure time / reaction time now significant ;   [1]

(f) (grav.) potential energy to kinetic energy ;   [1]

[Total: 10]