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

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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) $V = \pi d^2 h / 4 = 3.14 \times 5.7^2 \times 8.2 / 4 = 209 / 209.2$; [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 ;
3. air bubbles in the water ;
4. warmer / colder affecting density ;

Any two [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
Z / 1.5
} in this order ; [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]