www.dynamicpapers.com

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0653 COMBINED SCIENCE

0653/23 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, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2015 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

® IGCSE is the registered trademark of Cambridge International Examinations.

CAMBRIDGE
International Examinations

www.dynamicpapers.com

1 **(a)** bronchus correctly labelled ;
trachea correctly labelled ;
larynx correctly labelled ; [3]

(b) smaller airway diameter ;
presence of mucus obstructing flow ; [2]

(c) **(i)** (12.5 – 5.8) = 6.7 (dm^3 / min) ;
$(\frac{6.7}{5.8} \times 100) = 115$ **or** 116(%) ; [2]

(ii) breathe more quickly ;
take deeper / bigger breaths ; [2]

[Total: 9]

2 **(a)** decreases **and** endothermic ; [1]

(b) hydrogen ; [1]

(c) rate of reaction increases / bubbles produced more rapidly / greater temperature change / increases rate of temperature change / reaction will finish faster ; [max 1]

(d) copper below hydrogen in the reactivity series ;
copper will not displace hydrogen from acid / will not react ;
no temperature change ;
copper is less reactive than magnesium ; [max 2]

[Total: 5]

3 **(a)** **(i)** weight / gravitational force ; [1]

(ii) newton ; [1]

(b) potential (energy) → kinetic (energy) ;
kinetic (energy) → potential (energy) ; [2]

(c) **A** to **B** accelerating ;
B to **C** constant speed ; [2]

(d) (distance =) speed × time 9 × 2 ;
= 18 (m) ; [2]

[Total: 8]

© Cambridge International Examinations 2015

www.dynamicpapers.com

4 (a) (i) contains the correct proportions of nutrients for an individual ; [1]

(ii) to prevent scurvy / AVP ; [1]

(iii) (vitamin C) is a small molecule / only large molecules need to be digested;
can be absorbed without being broken down ;
(vitamin C) must be soluble ; [max 2]

(b) (i) orange and kiwifruit ;
(because) **both** have average portion values greater than 60 mg ;
OR
orange **AND** has average portion value 70 g / greater than 60 mg ;
kiwifruit **AND** has average portion value 74 g / greater than 60 mg ; [max 2]

(ii) $\frac{60}{28}$;
$\times$ 100 = 214.3 (g) ; [2]

(c) (i) acid would attack / destroy the enamel ; [1]

(ii) regularly clean teeth / use mouth wash ; [1]

[Total: 10]

5 (a)

;;

all 4 correct for 2 marks, 3 or 2 correct for 1 mark [2]

© Cambridge International Examinations 2015

www.dynamicpapers.com

(b)

; [1]

(c)

observation	*explanation*
(bubbles of gas)	hydrogen ;
(indicator changes from green to purple)	alkaline solution ;

[2]

(d) (i)

substance	*diagram*
(chlorine)	**A**
(sodium)	**B**
(sodium chloride)	**C**

;;
all 3 correct for 2 marks, 2 or 1 correct for 1 mark [2]

(ii) sodium atoms lose electrons ;
chlorine atoms gain electrons ;
electrons are transferred from sodium to chlorine ;; [max 2]

(iii) opposite charges (attract) ; [1]

(iv) ($ZnCl_2$) symbols ;
numbers ; [2]

[Total: 12]

6 (a) (i) (speed =) $\frac{30}{10}$ = 3 (m / s) ; [1]

(ii) (frequency = $\frac{10}{20}$) = 0.5 ;
Hz / hertz ; [2]

(b) (distance moved = 2 × amplitude) = 1.0 (m) ; [1]

(c) **R** in right hand end box ; [1]

(d) no CO_2 emissions / wave energy comes for free / renewable / AVP ; [max 1]

[Total: 6]

© Cambridge International Examinations 2015

www.dynamicpapers.com

7 **(a)** **(i)** reduces soil erosion ;
<u>roots</u> of trees stabilise soil ; [2]

(ii) provides habitats ;
provides shelter / protection from sun / rain / predators ;
maintains food supply ; [max 2]

(b) **(i)** bacteria / microbes use it ;
for respiration ; [2]

(ii) (sewage) blocks / reduces light ;
light is needed for photosynthesis ; [2]

[Total: 8]

8 **(a)** **(i)** copper carbonate + hydrochloric acid → copper chloride + carbon dioxide + water

water in product row ;
rest of equation correct ; [2]

(ii) limewater ;
milky / cloudy ; [2]

(b) **(i)** *(cathode)* copper ;
chlorine ; [2]

(ii) an ionic compound ;
an element ;
a covalent compound ; [3]

[Total: 9]

9 **(a)** (thermal) expansion ; [1]

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

(ii) convection ; [1]

(c) **(i)** evaporation ; [1]

(ii) molecules gain more energy on heating ;
molecules with enough / high / higher energy escape ; [2]

[Total: 6]

© Cambridge International Examinations 2015

www.dynamicpapers.com

10 (a) (i) (charging by) friction / rubbing with cloth / AVP ; [1]

(b) plastic is an insulator ;
so charge wouldn't leak away ;
OR
metal is conductor ;
so charge would leak away / earthed by student ; [2]

(c) (i) flow of charge ; [1]

(ii) workable circuit with additional heater in series / parallel and at least one switch and no short circuit ;
two heaters in parallel ;
both switches on parallel branches ; [3]

[Total: 7]

© Cambridge International Examinations 2015