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

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CAMBRIDGE
International Examinations

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]

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]

(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]

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

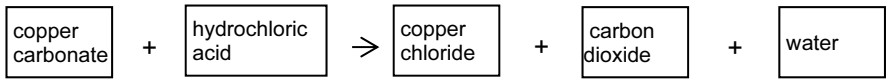
(ii) provides habitats ;
provides shelter / protection from sun / rain / predators ;
maintains food supply ; [max 2]

(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)**



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]

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]