Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/23**

Paper 2 Core Theory **May/June 2016**

MARK SCHEME

Maximum Mark: 80

Published

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1 (a)

function	name of organ(s)
ingestion	**mouth ;**
absorption of digested food	**small intestine ;**
secrete digestive enzymes	**salivary glands ; small intestine ; pancreas ;** max 2

[4]

(b) plasma ; [1]

(c) diffusion ;
from high concentration to low concentration ; [2]

(d) (i) pH 2.7 allow 0.1 pH tolerance ; [1]

(ii) activity would disappear ;
graph shows no activity above pH 4.5 ; [2]

2 (a) (i) electrolysis ; [1]

(ii) name: bromine ;
colour: brown / orange-brown ; [2]

(b) copper chloride → copper + chlorine ; [1]

(c) (i) increase ; [1]

(ii) electron ; proton ; neutron ; [3]

(iii) no. protons + no. neutrons / number of particles in the nucleus ; [1]

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

(b) (i) *Either* it does not affect the speed *(no mark)*
weight / force / gravity acts downwards ;
or it decreases the speed of the cart *(no mark)*
due to friction / frictional forces ; [1]

(ii) (average) speed = distance / time (or rearranged) ;
time = (distance / speed) = 20 / 8 = 2.5 (s) [2]

(iii) horizontal straight line for constant speed / slightly sloping line for decreasing speed ; smooth sloping line (straight or curved) down to speed = 0 ; [2]

(c) (from) potential (energy) / gravitational potential (energy) ; (to) thermal / heat (energy) ; [2]

4 **(a)** cell membrane ; ions ; xylem ; transpiration ; [4]

(b) idea of: root hair cells are very delicate / fine / are easily damaged (by soil) / owtte ; [1]

(c) **(i)** carbon dioxide + water ; (→) sugar / glucose + oxygen ; [2]

(ii) light ; supply of carbon dioxide ; chlorophyll / chloroplasts ; (suitable temperature) ; [max 2]

5 **(a)** **(i)** fractional distillation ; [1]

(ii) (compound / molecule) containing hydrogen and carbon ; only ; [2]

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

(ii) oxygen ; [1]

(c) **(i)** C_2H_5 correct ; –O-H correct ; [2]

(ii) carbon dioxide ; water / steam / water vapour ; [2]

6 **(a)** thermal expansion (of sea water) ; owtte [1]

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

(ii) no effect ; decrease / cool ; [2]

(c) (i) radiation ; [1]

(ii)

gamma rays	X-rays		(visible) light	**infrared**		radio waves

1. infrared ; – **must** be circled
2. (visible) light ; – **must not** be circled
infrared in correct space ;
light in correct space ; [4]

7 (a) (i)

organism	producer	consumer	herbivore	carnivore
buzzard		✓		✓
grass	✓			
snail		✓	✓	
thrush		✓		✓

one mark for each correct line ;;; [3]

(ii) grass → snail → thrush → buzzard
organisms in correct order ;
arrows in correct direction ; [2]

(b) (i) keeping cattle / growing rice / leaving rubbish in dumps / avp ; [1]

(ii) it is a greenhouse gas / traps heat / infra-red radiation ;
it contributes to global warming ; [2]

8 (a) (i) (most reactive) calcium
zinc
iron
copper ; [1]

(ii) bubbles of gas / fizzing / effervescence / dissolving ; [1]

(b) (test) aqueous sodium hydroxide / aqueous ammonia ;
(iron(II) ions) (gelatinous) green precipitate / green solid ;
(iron(III) ions) brown precipitate / brown solid ; [3]

(c) (i) exothermic ; [1]

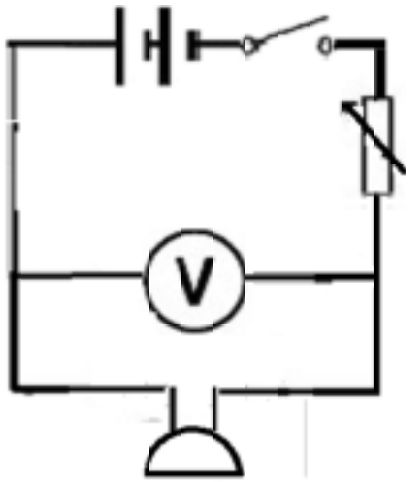
(ii) 1+ / +1 / Na^+ / Na^{1+} ; [1]

(iii) (sodium atom) loses one / an electron ; [1]

9 (a) (i) resistor ; *accept* variable resistance / rheostat [1]

(ii) changes / varies current ;
changes / p.d. across the buzzer ; owtte
changes the resistance in the main circuit ; [max 2]

(iii)



ammeter symbol;
ammeter in series with buzzer (any correct point in circuit, *reject* if in the voltmeter branch) ;
all else correct (ignore tiny gaps in wiring) ; [3]

(b) use of correct reading off graph at 6 V > 0.015 A ;
resistance at 6 V = 6 / 0.015 = 400 (Ω) ; [2]

(c) frequency unchanged / remains the same ;
amplitude increases ; [2]