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Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/32**

Paper 3 Core Theory **March 2018**

MARK SCHEME

Maximum Mark: 80

Published

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.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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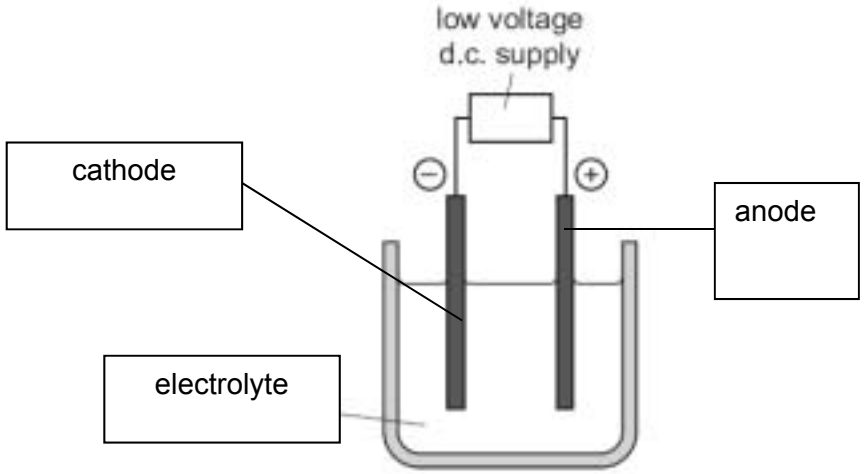
Question	Answer	Marks
1(a)(i)	cervix correctly labelled ; vagina correctly labelled ;	**2**
1(a)(ii)	zygote results from fertilisation ; cells divide / ball of cells forms ; (ball of cells / embryo) becomes <u>implanted</u> ; in wall of uterus / uterus lining ;	**max 3**
1(b)	haploid ; half ; diploid ;	**3**

Question	Answer	Marks
2(a)(i)	electrolysis ;	**1**
2(a)(ii)	 ;; all three correct (2) one or two correct (1)	**2**

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Question	Answer	Marks
2(a)(iii)	copper chloride / other soluble copper compound ;	1
2(a)(iv)	dissolve in water ;	1
2(a)(v)	chemical *and* new substance(s) made ;	1
2(b)(i)	carbon / hydrogen ;	1
2(b)(ii)	reduction ;	1
2(c)(i)	form coloured compounds ;	1
2(c)(ii)	increases reaction rate ;	1

Question	Answer	Marks
3(a)	gravitational force / weight ;	1
3(b)	speed = distance / time *or AV* ; distance (= speed $\times$ time) = 28 000 $\times$ 90 / 60 = 42 000 (km) ;	2
3(c)	density = mass / volume ; = 5972 $\times$ 10^{21} / 1.08 $\times$ 10^{21} = 5530 ; (units) kg / m^3 ;	3
3(d)(i)	electrical (energy in solar cells) ; chemical (energy in the batteries) ;	2
3(d)(ii)	regular arrangement of at least 10 atoms of similar size ; all touching ;	2

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Question	Answer	Marks
4(a)	an animal that gets its energy / feeds only on plants ;	**1**
4(b)(i)	growth (of tissues) ; repair (of tissues) ;	**2**
4(b)(ii)	20.0 / 2.6 ; ×100 = 770 ;	**2**
4(b)(iii)	the bamboo does not contain much protein / nutrition ; a lot needed to satisfy need / panda needs a lot because it is big ;	**2**
4(c)	only food supply disappearing ; danger of loss of habitat ; more difficult to find a mate ;	**max 2**

Question	Answer	Marks
5(a)(i)	compound containing hydrogen and carbon ; only;	**2**
5(a)(ii)	;; LHS (1) RHS either order (1)	**2**
5(a)(iii)	exothermic ;	**1**
5(a)(iv)	heating / cooking ;	**1**
5(b)	idea that oil and grease provide a barrier against oxygen / water ;	**1**

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Question	Answer	Marks
6(a)(i)	sound ;	1
6(a)(ii)	from handset to base station (or reverse) ; from satellite dish to satellite (or reverse) ;	2
6(b)	gamma rays | | | visible light | infrared waves | microwaves ; | radio waves;	2
6(c)	(infrared) radiation from Sun absorbed during day ; at night, radiation from satellite results in cooling ;	2
6(d)	sound needs a medium to travel through – no medium in space ;	1

Question	Answer	Marks
7(a)	One mark for each correct line of table ;;;;	4

fact	process		
	respiration	photosynthesis	chemical digestion
needs light		✓	
takes place in animals	✓		✓
needs carbon dioxide		✓	
produces smaller molecules from larger molecules	✓		✓

7(b)(i)	shading in at least one area of xylem in stem ; shading in at least one area of xylem in root ;	2

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Question	Answer	Marks
7(b)(ii)	root hair cells ;	**1**
7(b)(iii)	replace water lost in transpiration / prevent wilting ; to carry minerals to all parts of the plant ; raw material in photosynthesis ;	**max 1**
7(c)	transports food / sugars / amino acids ;	**1**

Question	Answer	Marks
8(a)(i)	(electrons) 17 (neutrons) 18 (protons) 17 ;; all three correct (2) one or two correct (1)	**2**
8(a)(ii)	<table><tr><th>(particle)</th><th>(relative charges)</th><th>(approximate relative masses)</th></tr><tr><td>(electrons)</td><td>–1</td><td>negligible / 1/2000</td></tr><tr><td>(neutrons)</td><td>0 / none</td><td>1</td></tr><tr><td>(protons)</td><td>+1</td><td>1</td></tr></table> ;; all three relative charges (1) all three approximate relative masses (1)	**2**
8(b)	(sodium and chlorine) ionic *and* (hydrogen and chlorine) covalent ; (sodium explanation) metal and non-metal / loss gain of electrons ; (hydrogen explanation) two non-metals / shared electrons ;	**3**

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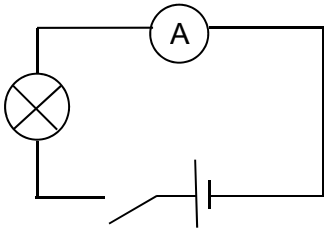
Question	Answer	Marks
8(c)	(sodium) bromide **AND** (magnesium) iodide ;	**1**
8(d)	(test) (damp) litmus paper ; (result) bleaches / turns white ;	**2**

Question	Answer	Marks
9(a)(i)	 both ammeter and lamp symbols correct ; complete series circuit ;	**2**
9(a)(ii)	voltmeter symbol correct ; connected in parallel with lamp ;	**2**
9(b)(i)	R = V / I ; = 1.5 / 0.6 = 2.5 ; Ω / ohm ;	**3**
9(b)(ii)	total resistance in circuit increases ; voltage same, so current must decrease ;	**2**

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