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Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/33**

Paper 3 Core Theory **October/November 2017**

MARK SCHEME

Maximum Mark: 80

Published

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Question	Answer	Marks
1(a)	xylem ; mesophyll cells ; stomata ;	**3**
1(b)	any two from photosynthesis ; transport of ions ; support / turgor ; AVP ;	**max 2**
1(c)	ions / named ion ; soluble nutrients / named soluble nutrient ; hormones / named hormone ; carbon dioxide ; AVP ;	**max 2**
1(d)(i)	transport of oxygen ;	**1**
1(d)(ii)	to replace iron lost during menstruation / period ;	**1**
1(d)(iii)	feeling tired / dizzy ;	**1**

Question	Answer	Marks
2(a)(i)	Any two from electrical conductor ; thermal / heat conductor ; malleable ; ductile ; sonorous ;	**max 2**
2(a)(ii)	high density / high melting point / coloured compounds ;	**1**
2(b)(i)	(iron) + sulfuric acid ➔ iron sulfate + hydrogen ;	**1**
2(b)(ii)	(anion) chloride ; (acid) hydrochloric (acid) ;	**2**
2(c)	number of protons in an atom / nucleus ;	**1**

Question	Answer	Marks
3(a)	(Q =) friction / (water) resistance ; (R =) gravitational force / weight ;	**2**
3(b)	(forces P and R) equal / balanced ;	**1**
3(c)(i)	P / uplift ;	**1**
3(c)(ii)	gamma | | | visible light | | micro-waves | radio waves ;	**1**
3(c)(iii)	sound ;	**1**
3(d)	nuclear / batteries ;	**1**
3(e)	either 30 km = 30 000 m or 1 hour = 3600 s ; (30 000 / 3600) = 8.3 m / s ;	**2**

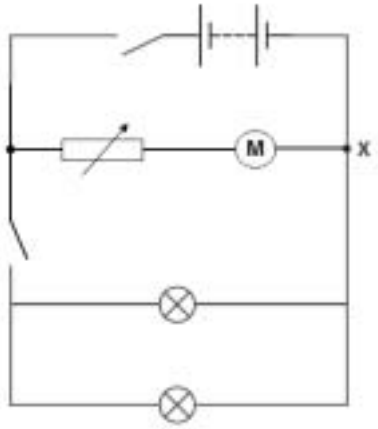
Question	Answer	Marks
4(a)	**A** oesophagus ; **B** colon / large intestine ;	**2**
4(b)(i)	stomach ; **any two** from stomach has acidic conditions ; pH 2 is acidic ; enzyme only worked in tube 1 / tube 1 was acidic / at the optimum pH ;	**max 3**
4(b)(ii)	enzyme will become inactive / destroyed at this temperature ;	**1**
4(b)(iii)	large / protein molecules are broken down ; by the action of an enzyme / acid ;	**2**
4(b)(iv)	chewing food (in mouth) ;	**1**

Question	Answer	Marks
5(a)(i)	distillation ;	**1**
5(a)(ii)	decrease ;	**1**
5(b)	(filtration) remove (named) solids ; (chlorination) kill microbes / bacteria / sterilizes ;	**2**
5(c)(i)	(refinery gas) bottled gas / heating / cooking ; (gas oil) diesel fuel / diesel engines / diesel vehicles ;	**2**
5(c)(ii)	compound / molecule containing hydrogen and carbon ; only (C and H);	**2**
5(d)(i)	**A** **F** ;	**1**
5(d)(ii)	**B** ;	**1**

Question	Answer	Marks
6(a)	temperature at which a solid changes to a liquid owtte	**1**
6(b)(i)	conduction **and** convection ;	**1**
6(b)(ii)	(reduces convection) as no (gas) circulation (possible) *owtte* ; (reduces conduction) as foam is a bad conductor *owtte* ;	**2**
6(c)	infra-red	**1**
6(d)	$d = m / V$ = (1900 / 2000) ; = 0.95 (g / cm^3) ;	**2**

Question	Answer	Marks
7(a)	transpiration ;	**1**
7(b)(i)	carbon dioxide from the air ; is used in photosynthesis / reacts with water ;	**2**
7(b)(ii)	by respiration ; carbon dioxide released ;	**2**
7(c)	*rainfall reduced (no mark)* less water being transpired / evaporated from trees ;	**1**
7(d)	soil easily eroded ; due to lack of tree roots ;	**2**

Question	Answer	Marks
8(a)(i)	(left) cathode ; (right) anode ;	**2**
8(a)(ii)	orange / brown gas ;	**1**
8(b)	(reduced) oxygen is removed ;	**1**
8(c)	K Ca Mg Cu ;;	**2**
8(d)(i)	any two from heat / increase temperature ; increase surface area of magnesium ; increase concentration of acid ; use / add a catalyst ;	**2**
8(d)(ii)	magnesium chloride ;	**1**
8(d)(iii)	filter / filtration ;	**1**

Question	Answer	Marks
9(a)	 motor in parallel with headlamps ; variable resistor in motor branch, correct symbol ; switch for headlamps after motor branch, before first headlamp branch ; all wires required for complete circuit ;	**4**
9(b)	(decreasing resistance) increases current (so faster motor) ;	**1**
9(c)	in parallel ; the same as ; less than ;	**3**
9(d)	rain / water / damaged insulation / AVP ; protect from rain or water / use of protective cover / sensible suggestion related to hazard identified ;	**2**