



CO-ORDINATED SCIENCES

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Paper 3 Theory (Core)

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MARK SCHEME

Maximum Mark: 120

Published

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Question	Answer	Marks
1(a)(i)	C ; B ; A ;	3
1(a)(ii)	accept a label drawn anywhere between the larynx and the top of the bronchus ;	1
1(b)	higher ; lower ; down ;	3
1(c)(i)	less oxygen ; more water ; warmer / higher temperature ;	max 2
1(c)(ii)	faster / more frequent / more breaths ; deeper ;	2

Question	Answer	Marks
2(a)(i)	number of protons ; in one atom (of an element) ;	2
2(a)(ii)	water is not an element / is a compound / only elements in Periodic Table ;	1
2(a)(iii)	22 ; 18 ;	2
2(a)(iv)	air ;	1
2(a)(v)	argon does not react with the steel / argon is unreactive ;	1
2(b)(i)	the higher the temperature the higher the solubility ;	1
2(b)(ii)	at 30 °C maximum mass that dissolves is (about) 47 g / less than 60 g ; so not all the solid can dissolve / some solid settles out / owtte ;	2

Question	Answer	Marks
3(a)(i)		3
3(a)(ii)	'X' on testis ;	1
3(b)(i)	egg / ova / ovum ;	1
3(b)(ii)	fertilisation ;	1
3(b)(iii)	zygote ;	1

Question	Answer	Marks
4(a)	distance = 687 000 (m) ; time = 777 600 (s) ; 0.88 (m / s) ;	3
4(b)	area ; force (weight) ;	2
4(c)(i)	20 Hz to 20 000 Hz ;	1
4(c)(ii)	any value between 20 000 to 35 000 Hz ;	1
4(d)	named electromagnetic wave ; use ;	2

Question	Answer	Marks
5(a)(i)	sulfur dioxide ; sulfur dioxide dissolves in / reacts with (rain) water / sulfur dioxide is a non-metal oxide ;	2
5(a)(ii)	sulfuric (acid) ; (calcium) carbonate ; carbon dioxide ;	3
5(b)(i)	7 ;	1
5(b)(ii)	liquid F is the most acidic ; so highest rate of reaction with magnesium / the more concentrated the acid the higher the rate that gas is produced ;	2
5(b)(iii)	temperature also affects rate / reference to fair testing ;	1

Question	Answer	Marks
6(a)(i)	(rate of) water uptake / transpiration increases then decreases ; extra detail e.g. increases until / peaks at, 1200 / 25 g / h ;	2
6(a)(ii)	stomata shut ; lower temperature ; no light ; reduced wind speed ; increased humidity ;	max 2
6(a)(iii)	22 (grams per hour) ;	1
6(b)(i)	CBEAD ;	1
6(b)(ii)	absorb mineral ions ;	1
6(b)(iii)	photosynthesis ; transport (ions / sugars) ; support / turgor ; growth / part of cytoplasm ;	max 1

Question	Answer	Marks
7(a)(i)	8 (m / s) ;	1
7(a)(ii)	X at 100 s ;	1
7(b)	S greater than Q ; S and Q in opposite directions ;	2
7(c)(i)	move faster ;	1
7(c)(ii)	more frequent collisions / collide at greater speed (with wall) ; more force exerted on tyre walls ;	2
7(d)	ray enters undeviated and first reflection ; second reflection and exit from prism ;	2
7(e)(i)	$I = V / R$; $= 24 / 5.6 = 4.29 \text{ A}$;	2
7(e)(ii)	if one lamp fails the other will still light up / work / have a complete circuit ;	1

Question	Answer	Marks
8(a)(i)	chromatography ;	1
8(a)(ii)	no new substances produced / only separating existing substances ;	1
8(b)	polymerisation ; reduction ; cracking ;	3
8(c)(i)	negative electrode inside the tube labelled cathode ; solution labelled electrolyte ;	2
8(c)(ii)	P is oxygen ; Q is hydrogen ;	2
8(d)	sulfate ;	1

Question	Answer	Marks
9(a)	milk ; butter ; tuna fish ;	3
9(b)(i)	provide energy / insulation ;	1
9(b)(ii)	carbon, hydrogen and oxygen ;	1
9(b)(iii)	fatty acids and glycerol ;	1
9(c)	<i>any two of the following</i> movement respiration excretion sensitivity reproduction growth ;	max 2

Question	Answer	Marks
10(a)	A ; C ; B / D ;	3
10(b)(i)	plant / grow, more, trees / plants ; reduce combustion of fossil fuels ;	2
10(b)(ii)	global warming ;	1

Question	Answer	Marks
11(a)	doesn't work at night / when there is little light ;	1
11(b)	convection ;	1
11(c)(i)	atoms of the same element that have same proton number but different neutron number etc. ;	1
11(c)(ii)	$2p + 2n$ / helium nucleus ;	1
11(c)(iii)	ionises atoms / molecules in cells ; causes mutation / cancer ;	2
11(c)(iv)	alpha particles are absorbed by 5cm of air ;	1
11(d)	laterally inverted same size not upside down virtual one correct one mark ; all three correct two marks ;	2

Question	Answer	Marks
12(a)	KE of waves to KE of moving air ; KE of moving air to KE of turbine ; KE of turbine to KE of generator ; KE of generator to electrical energy ;	max 2
12(b)	will not run out ; fossil fuels can be used for other purposes ; less pollution than using fossil fuels ;	max 2
12(c)(i)	0.4 (m) ;	1
12(c)(ii)	4 (m) ;	1
12(d)(i)	evaporation ;	1
12(d)(ii)	freezing ;	1
12(d)(iii)	volume = mass / density ; = $500 / 0.93 = 537.6 \text{ (cm}^3\text{)}$;	2

Question	Answer	Marks
13(a)	C – C single bond / – O – H ; all else correct ;	2
13(b)(i)	(fractional) distillation ;	1
13(b)(ii)	it is a condenser / condenses (hot) vapours to liquid ;	1
13(b)(iii)	ethanol has a lower boiling point / ethanol easier to boil than water ;	1
13(c)(i)	flame ; pops ;	2
13(c)(ii)	gas / hydrogen released ;	1
13(c)(iii)	reaction speed higher in water ;	1
13(d)	in any order water because it turns cobalt chloride from blue to pink ; carbon dioxide because it turns limewater milky ;	2