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Paper 2 Theory

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MARK SCHEME

Maximum Mark: 100

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Question	Answer	Marks
1(a)	mass – amount of substance ; weight – effect of gravity on a mass ;	2
(b)(i)	rock one side of fulcrum, hammer other side equidistant on each side ;	1
(b)(ii)	$F=ma$ or $1.25 = 0.75 \times a$ or $F/m=a$ or $1.25/0.75 (=a)$; 1.67 ; m/s^2 ;	3
	Total:	6

Question	Answer	Marks
2(a)(i)	28 ;	1
(a)(ii)	56 ; 1.4 ;	2
2(b)	incomplete combustion ; of carbon-containing substances / fuels ;	2
2(c)	3 2 3 ;	1
	Total:	6

Question	Answer			Marks	
3(a)(i)		structure	arteries	veins	2
		thickness of wall	thick	thin ;	
		size of lumen	small / narrow	large / wide ;	
3(a)(ii)			arteries	veins	2
		blood pressure	high / fluctuating	low / steady ;	
		direction of blood flow	away from the heart	towards the heart ;	
3(b)	any one from • small diffusion distance / rapid diffusion ; • chemicals are easily exchanged (between blood and cells / tissue fluid) ;				1
3(c)(i)	to prevent backflow of blood (by closing) ;				1
3(c)(ii)	any two from blood pressure (in arteries) is high ; so blood will not flow backwards ;				2
	Total:				8

Question	Answer	Marks
4	any three from • electrons ; • electrons have negative charge ; • transfer / movement to the (girl's) hand ; • opposite charges attract ;	3
	Total:	3

Question	Answer	Marks
5(a)(i)	<u>halogens</u> ;	1
5(a)(ii)	increase ;	1
5(b)	a <u>molecule</u> containing two atoms ;	1
5(c)	iodine is less reactive ;	1
5(d)	<u>kills</u> bacteria ;	1
	Total:	5

Question	Answer	Marks
6(a)	arrow from tree going to finch ; 2 arrows from finch going to hawk and to eagle ;	2
6(b)(i)	the sun ;	1
6(b)(ii)	locust / aphid / finch ;	1
6(c)	finches would increase in number ; because they are not eaten by the eagles ; OR finches would decrease in number ; because there would be more hawks (as not eaten by eagles) so they would eat more finches ;	2
	Total:	6

Question	Answer	Marks
7	1.3(3...3) ;	3
	Total:	3

Question	Answer	Marks
8(a)	64 ; 49 49 ;	2
8(b)	indium ;	1
8(c)	in same group as aluminium ; has 3 electrons in outer shell ;	2
	Total:	5

Question	Answer	Marks
9	<u>anther</u> ; carpel / stigma ; <u>cotyledon</u> ; <u>radical</u> ; <u>shoot</u> ;	5
	Total:	5

Question	Answer	Marks
10(a)	energy outputs = 100% ; energy output = energy input ;	2
10(b)	chemical to heat (during burning) ; heat to kinetic (in the turbines) ; kinetic to electrical ;	3
	Total:	5

Question	Answer	Marks
11(a)(i)	hydrogen ;	1
11(a)(ii)	1–3 ; orange ;	2
11(b)(i)	any two from • zinc hydroxide ; • zinc carbonate ; • zinc oxide ;	2
11(b)(ii)	(too) low in the reactivity series ;	1
	Total:	6

Question	Answer	Marks
12(a)		5
12(b)(i)	villi are responsible for absorption ; (Q) has more villi (per cm²) than the other three students ;	2
12(b)(ii)	any one from - absorbed substances are removed by the blood ; - concentration gradient maintained ;	1
	Total:	8

Question	Answer	Marks
13(a)(i)	$V = IR$; $12 = 0.08 \times R$ or $R = 12/0.08$; 150 ;	3
13(a)(ii)	$E = ItV$ or $0.08 \times 30 \times 12$; 28.8 ;	2
13(b)(i)	$(0.48 + 0.16 + 0.24 =) 0.88$;	1
13(b)(ii)	any one from it is a parallel circuit ; different resistance (in parallel) ; bigger voltage across each component ;	1
	Total:	7

Question	Answer	Marks
14(a)	A = steam ; B = polymerisation ;	2
14(b)	addition / gain of hydrogen ;	1
14(c)	bromine ;	1
14(d)(i)	$ \begin{array}{c} \text{H} \quad \text{H} \\ \quad \\ \text{H} - \text{C} - \text{C} - \text{O} - \text{H} ; \\ \quad \\ \text{H} \quad \text{H} \end{array} $	1

Question	Answer	Marks
14(d)(ii)	any one from • solvent ; • fuel ; • antiseptic wipes ;	1
	Total:	6

Question	Answer	Marks
15(a)	A = sperm duct ; B = <u>penis</u> ; C = <u>urethra</u> ; D = testis ;	4
15(b)	<i>prostate gland</i> : produces liquid (for sperm to swim in) / mucus / alkaline liquid ; <i>scrotum</i> : protects testis / keeps testes cool ;	2
15(c)	accept cross on sperm duct in any position ;	1
	Total:	7

Question	Answer	Marks
16(a)	one-quarter wavelength correctly labelled anywhere on Fig. 6.2 ;	1
16(b)(i)	1.2 (m) ;	1
16(b)(ii)	$v = f \lambda$ or $330 = f \times 1.2$; $f = 275$;	2
	Total:	4

Question	Answer	Marks
17(a)	potassium nitrate ;	1
17(b)	calcium carbonate ;	1
17(c)	oxygen ;	1
17(d)	nitrogen dioxide ;	1
17(e)	nitrogen ;	1
	Total:	5

Question	Answer	Marks
18(a)	any three from • alternating current ; • (causes) changing magnetic field (in primary) ; • core connects magnetic field to secondary coil ; • magnetic field cuts/induces e.m.f. in secondary coil ;	3
18(b)	$V = IR$ or $V = 100 \times (1 / 1\,000)$; 0.1 ;	2
	Total:	5