

1	(a)		2 460 000	1	B1	accept 2,460,000 or 246 0000
	(b)		7.4×10^{-4}	1	B1	
	(c)			2	M1	for correct value not in standard form e.g. 58.3×10^5 or 583×10^4 or 0.583×10^7 oe
			5 830 000		A1	5 830 000 or 5.83×10^6 do not isw.
Total 4 marks						

2	(a)		0.0057	1	B1	
	(b)		8×10^5	1	B1	
	(c)	$\frac{273000}{6 \times 10^{-2}}$		2	M1	for 273 000 or digits 455
			4 550 000		A1	for 4 550 000 or 4.55×10^6 oe
Total 4 marks						

3	(a)		3.74×10^7	2	B2	B1 for 37 400 000 (oe but not in standard form) or 3.74×10^n ($n \neq 7$) or 3.7×10^7 or 3.8×10^7
	(b)		11	1	B1	Allow 11 $\rightarrow$ 11.1
Total 3 marks						

4	(a)		0.000 78	1	B1	
	(b)	22 500 000 oe e.g. 22.5×10^6 or 2.25×10^n $n \neq 7$		2	M1	
			2.25×10^7		A1	
Total 3 marks						

5	(a)	$1.4 \times 10^9 - 8.2 \times 10^7$ or $1.4 \times 10^9 - 0.082 \times 10^9$ or $140 \times 10^7 - 8.2 \times 10^7$ ($= 131.8 \times 10^7$)		2	M1	or for 1 318 000 000 oe but not in standard form eg 1318×10^6 or 1.318×10^n where $n \neq 9$
		<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	1.318×10^9		A1	Allow 1.32×10^9 or 1.3×10^9
	(b)	$\frac{9.9 \times 10^6}{9.1 \times 10^5}$ oe		2	M1	
		<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	11		A1	allow 10.8 – 11 (inclusive) SC: if M1 not scored, award B1 for an answer of $\frac{1}{11}$ allow 10.8 – 11 for the denominator
Total 4 marks						

6	(a)		Pacific	1	B1	Accept 1.357×10^5
	(b)	$1.119 \times 10^5 - 1.797 \times 10^4$		2	M1	Accept 111 900 – 17 970 oe or 93 930 or –93 930
			$9.393(0) \times 10^4$		A1	Accept ($\pm$) 9.393(0) $\times 10^4$ or ($\pm$) 9.39×10^4 or ($\pm$) 9.4×10^4
Total 3 marks						

7	(a)		2.84×10^9	1	B1	
	(b)		0.000 25	1	B1	
Total 2 marks						

8	(b)	$3 \times 10^{125} + 2 \times 10^{124}$ or digits 1024 $\times 10^n$ oe		3	M1	
		32×10^{124} or $3 \times 10^{125} + 0.2 \times 10^{125}$ or $30 \times 10^{124} + 2 \times 10^{124}$			M1	oe ‘correct’ answer in incorrect form.
			3.2×10^{125}		A1	

9	(a)		8 800 000	1	B1
	(b)		Barcelona	1	B1 accept 5.5×10^6
	(c)	$3.7 \times 10^7 - 7.7 \times 10^6$ or 29 300 000 oe or 37 000 000 – 7 700 000 or 29 000 000 oe or $0.29(3) \times 10^8$ or $29(.3) \times 10^6$		2	M1 allow $2.9(3) \times 10^n$ ($n \neq 7$)
			2.9×10^7		A1 accept -2.9×10^7 accept 2.93×10^7 or -2.93×10^7
Total 4 marks					

10	(a)		8.9×10^{-5}	1	B1
	(b)		83 400	1	B1
Total 2 marks					

11	(a)		50 000	1	B1
	(b)		6×10^{-5}	1	B1
	(c)	$2.5 \times 10^{512-700}$ or 2.5×10^n or 0.25×10^{-187} or $p \times 10^{-188}$ where $1 \leq p < 10$		2	M1
			2.5×10^{-188}		A1
Total 4 marks					

12		$12.6 \times 10^{(-24+145)}$ or 12.6×10^{121} or 1.26×10^n		2	M1
			1.26×10^{122}		A1 allow 1.3×10^{122}
Total 2 marks					

13	(a)		0.000 0932	1	B1
	(b)		2.4×10^5	2	B2 If not B2, then B1 for 240 000 or 24×10^4 oe or 2.4×10^a $a \neq 5$
	(c)		1.8×10^{121}	2	B2 If not B2, then B1 for 18×10^{120} or 1.8×10^b $b \neq 121$
Total 5 marks					

14	(a)		0.000 625	1	B1
	(b)	25 000 000 oe e.g. 25×10^6 or 0.25×10^8 or 2.5×10^n $n \neq 7$		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	2.5×10^7		A1
Total 3 marks					

15	(a)		0.0056	1	B1
	(b)	20 000 000 oe eg 20×10^6 or 0.2×10^8 or 2×10^n $n \neq 7$ or $\frac{6 \times 10^{(3+5)}}{21+9}$ or $\frac{6 \times 10^8}{30}$ or $\frac{6 \times 10^3}{3 \times 10^{-4}}$ or $\frac{6000}{0.0003}$ or $\frac{6000}{3 \times 10^{-4}}$		2	M1
		Correct answer scores full marks (unless from obvious incorrect working)	2×10^7		A1
Total 3 marks					

16	(b)	$0.04 \times 4.5 \times 10^{157}$ oe $4 \times 10^{-2} \times 4.5 \times 10^{157}$ ($= 18 \times 10^{155}$) or 0.18×10^{157} oe		3	M1
		Correct answer scores full marks (unless from obvious incorrect working)	1.8×10^{156}		A1
SCB1 for $18 \times 10^{156} = 1.8 \times 10^{157}$ or $18 \times 10^{157} = 1.8 \times 10^{158}$					

17	(a)		7.6×10^7	1	B1
	(b)		0.000 54	1	B1
Total 2 marks					