

## Mark schemes

Q1.

(a)  $1.25 \times 10^4$

*accept  $10^4 \times 1.25$*

B1

Additional Guidance

$1.2 \times 10^4$  or  $1.3 \times 10^4$

B0

(b) 0.034

*accept  $\frac{34}{1000}$  (oe fraction)*

B1

Additional Guidance

If fraction given, ignore attempts to cancel

[2]

Q2.

(a) 0.0048

B1

(b) 0.000 012

B1

(c)  $2.5 \times 10^6$

B1

[3]

Q3.

(a)  $2.4 \times 10^8$

B1

(b)  $36 \times 10^{11}$  or 3 600 000 000 000  
or  $0.004 \times 900\,000\,000\,000\,000$

M1

$3.6 \times 10^{12}$

A1

[3]

Q4.

(a) 1

B1

(b)  $\frac{1}{5^3}$  or  $\frac{1}{125}$  or  $0.2 \times 0.2 \times 0.2$

$$\left(\frac{1}{5}\right)^3 \text{ or } 125^{-1} \text{ or } 0.23$$

M1

$$0.008 \text{ or } \frac{8}{1000}$$

A1

$$8 \times 10^{-3}$$

*ft Any decimal  $0 < x < 1$  correctly converted to standard form*

A1 ft

[4]

Q5.

(a)  $5.83 \times 10^{-4}$

B1

(b) 941 600

Additional Guidance

Accept 941,600 or 941 600.0(...)

B1

(c)  $7\,200\,000\,000 \div 300$   
 or  $7200 \times 10^6 \div 300$   
 or  $7.2 \times 10^9 \div 300$   
 or 24 million

*oe*

M1

$24\,000\,000$   
 or  $24 \times 10^6$   
 or  $0.024 \times 10^9$

*oe*

A1

$2.4 \times 10^7$

*ft M1 and their 24 000 000 written in standard form*

A1ft

[5]

Q6.

(a)  $1.8 \times 10^4$

*B1  $18 \times 10^3$  or 18 000 seen*

*B1 for  $\frac{1800000}{100}$  oe*

*B1 for  $300\,000 \times 0.06$*

B2

Additional Guidance

18,000

	<i>Standard notation</i>	B1
	18.000	
	<i>Continental notation</i>	B1
	1 800 000 × 0.01	B1
(b)	5 × 10 <sup>3</sup>	
	<i>B1 0.5 × 10<sup>4</sup> or 5 000 seen</i>	
	<i>B1 for 120 000 seen</i>	B2
	Additional Guidance	
	5,000	
	<i>Standard notation</i>	B1
	5.000	
	<i>Continental notation</i>	B1
		[4]
Q7.		
	9 × 10 <sup>3</sup>	B1
		[1]
Q8.		
	6.0052(00) × 10 <sup>6</sup>	
	<i>B1 for their 6 005 200 written normally and correctly converted to standard form</i>	
	<i>or no number written normally and answer 6.(...) × 10<sup>6</sup></i>	B2
	Additional Guidance	
	(6500200 and) 6.5002(00) × 10 <sup>6</sup>	B1
	65200 and 6.52 × 10 <sup>4</sup>	B1
	106 × 6.005 2(00)	B2
	Correct value of 6 005 200 with no conversion to standard form	B0
	6 × 10 <sup>6</sup> with no number written normally	B1
		[2]
Q9.		

$61.6 \times 103$

B1

[1]

Q10.

9.56 × 310 9563 9.56 × 103  
or 564 508 (.44) 9563 9560  
with no incorrect evaluations seen

*B1 9.563 × 103*

*or 9560*

*or 564 508 (.44) or 5.6(450844) × 105*

*SC1 9.56 × 103 9563 9.56 × 310 with no incorrect evaluations seen*

B2

Additional Guidance

Allow numbers to be written in original or converted form or as a mixture for B2 or SC1

Incorrect evaluation seen scores a maximum of B1

[2]

Q11.

(a)  $(2.318 \times 103) \div (3.8 \times 106)$

M1

6.1

A1

-4

A1

(b)  $A \times 107$

where  $2.0 < A < 3.0$ 

*B1  $A \times 106$*

*where  $20 < A < 30$*

*SC1  $A \times 106$  or  $A \times 108$*

*where  $2.0 < A < 3.0$*

B2

[5]

Q12.

(a)  $9.82 \times 102$   $9.81 \times 103$  9812

B1

(b) Any different example correctly evaluated

*eg  $2 \times 10^3$   $4 \times 10^2$   $8 \times 10^5$*

M1

Not correct and correct reason

or  
Not correct and counter example

*eg*

*Not correct*

*and*

$$4 \times 106 \times 3 \times 107 = (4 \times 3) \times 10 (6 + 7) \\ = 12 \times 1013$$

*Not correct and  $a \times c$  might be 10 or greater*

A1

[3]

Q13.

5 850 000 or 130 or 45 000  
or 4.5 or 104

M1

$$4.5 \times 10^4$$

A1

[2]

Q14.

$$5 \times 10^{-4}$$

B1

[1]

Q15.

(a) Explanation that in  $a \times 10^b$  the value of  $a$  must be range  $1 \leq a < 10$

*eg the first part should be 1.01376*

*Accept the correct conversion to*

$$1.01376 \times 10^5$$

B1

Additional Guidance

Ignore errors in inequalities given as a range for the acceptable first part of a number in standard form if the written answer shows clear understanding  
*eg in  $a \times 10^b$ ,  $a$  must be less than 10,  $0 < a < 10$*

B1

(b) Explanation that the power should be positive

*eg the power should be 5, not -5*

*this gives 0.0000101376 (or  $\frac{99}{9765625}$ )*

*Accept the correct conversion to*

$$1.01376 \times 10^5 \text{ unless awarded in 12(a)}$$

B1

Additional Guidance

Allow an incorrect conversion with a correct statement  
eg the power should be positive,  $-5$  gives  $0.00000101376$

B1

[2]

Q16.

$$0.99 \times 10^{-2}$$

B1

[1]

Q17.

(a) Malta

B1

(b) 16770000 or 16800000 or  $1.68 \times 10^7$  seen

M1

Netherlands

A1

[3]