1(a). The table below shows the number of tonnes of rice produced in a year in five countries.

Country	Rice produced (tonnes)
China	1.43×10^8
India	9.9×10^7
Vietnam	2.71×10^7
Thailand	2.05×10^7
Brazil	7.82×10^6

Which country produced the most rice?

(a) _____ **[1]**

(b). Write 2.71×10^7 as an ordinary number.

(b) _____ **[1]**

(c). How many **more** tonnes of rice did India produce than Thailand?
Give your answer in standard form.

(d) _____ tonnes **[2]**

2(a).

Write 543 000 in standard form.

_____ [1]

(b). Write 6.3×10^{-2} as an ordinary number.

_____ [1]

(c). Pierre is given this question.

> Work out.
> 61000 × 4000
> Give your answer in standard form.

Pierre's answer is 24.4×10^{7}.

Is Pierre correct?
Explain your answer.

---[1]

3(a).

Beth is given the following question.

> Work out
>
> $4.1 \times 10^5 \times 3 \times 10^2$.
>
> Give your answer in standard form.

This is Beth's answer to the question.

12.3×10^7

Explain why Beth's answer is incorrect.

---

[1]

(b). Show that

$$4.5 \times 10^2 + 7.3 \times 10^3 = 7.75 \times 10^3.$$

[2]

4. Write these numbers in order, starting with the largest.

8.1×10^{1} 1.02×10^{3} 9.83×10^{-2} 3×10^{2}

---------- , ---------- , ---------- , ---------- [1]

largest

5(a). A company makes sweets.
The sweets are put into packets.

Here are some facts.

1.47×10^7 sweets are made every day	3.5×10^5 packets of sweets are produced every day

Calculate the mean number of sweets in one packet.

---------- [2]

(b). Sweets are made on 288 days each year.

Calculate the number of sweets made each year.
Give your answer in standard form.

---------- [3]

(c). The company has 152 machines making the sweets.
Each machine operates for 15 hours each day.

(i) Calculate the number of sweets made by one machine each hour.
Give your answer as an ordinary number correct to the nearest 10.

---------- [1]

(ii) State one assumption you have made in part **(i)**.

---------- [1]

END OF QUESTION PAPER

Question			Answer/Indicative content	Marks	Guidance
1	a		China	1	
	b		27 100 000	1	
	c		7.85×10^7	2	**M1** for 9.9 – 2.05 **soi**
			Total	**4**	
2	a		5.43×10^5	1	**Examiner's Comments** Parts (a) and (b) were usually correct or not attempted. Part (c) was less successful with many candidates missing the crux of the question, simply completing the calculation and stating that it was the same as the given answer.
	b		**[0]**. 063	1	
	c		No, it isn't in standard form, e.g it should be 2.4**[4]** × 10^8	1	See appendix
			Total	**3**	
3	a		Valid explanation	1	Such as 'because it is not in standard form' eg because 12.3 is not a number between 1 and 10 See Appendix

Question			Answer/Indicative content	Marks	Guidance	
	b		450 + 7300	M1	or $0.45 \times 10^3 + 7.3 \times 10^3$ or $4.5 \times 10^2 + 73 \times 10^2$	Or correct use of a common power of 10
			$= 7750 = 7.75 \times 10^3$	A1	or complete working leading to 7.75×10^3	
					<u>Examiner's Comments</u> In part (a) some candidates identified that the answer was not written in standard form while others knew that 12.3 needed to be a number between 1 & 10 but some had difficulty explaining this. It was common for candidates to comment that Beth had multiplied 4.1 and 3 incorrectly, some suggesting it should be 12.1 not 12.3. Others stated that she shouldn't have added the indices or that she had not multiplied the two tens together. A few thought it needed brackets or the error was due to not using BIDMAS correctly. In part (b) candidates who were able to write the two numbers as 450 and 7300 were usually able to show the required result, although some showed confused working when they attempted to introduce a decimal point into 7750. Many made errors when attempting to obtain 450 & 7300 due to having too few or too many zeros on their values. Many omitted this part or reached a different answer to the one given in the question, usually 11.8×10^5.	
			Total	3		

Question			Answer/Indicative content	Marks	Guidance
4			1.02×10^3 , 3×10^2 , $8.1 \times 10^{[1]}$, 9.83×10^{-2}	1	Accept 1020, 300, 81, [0].0983 | Condone error in writing 0.0983 if order correct. Examiner's Comments This question was often reasonably answered. Many candidates got the correct answer for part (a) although 7^3 was a common wrong answer. In part (b) most candidates gained 1 mark for completing a line correctly. Very few gained both marks. Common errors were to write the value 64 in each row or to write too many "×2"s on the second row. Few kept the purpose of the working in mind to end with a power of 2. Part (c) was frequently correct. Many candidates, unnecessarily, converted the standard form into numbers before ranking.
			Total	1	

Question			Answer/Indicative content	Marks	Guidance	
5	a		42	2	M1 for $\frac{1.47\times10^7}{3.5\times10^5}$ oe If 0 scored SC1 for figs 42 in answer	Eg. $\frac{14\,700\,000}{350\,000}$
	b		$4.2[3\ldots] \times 10^9$	3	B2 for 4 233 600 000 oe as answer or M1 for *their* $1.47 \times 10^7 \times 288$ If 0 scored SC1 for figs 423[…] in answer	Eg. $423.[36] \times 10^7$ *their* 1.47×10^7 converted from info in (a)
	c	i	6450	3	B2 for 6447 to 6448 or M1 for $\frac{1.47\times10^7}{(152\times15)}$ oe or figs 6447 in answer	May be in stages. NB: $152 \times 15 = 2280$

Question			Answer/Indicative content	Marks	Guidance
		ii	Each machine makes the same amount of sweets. or There are no breakdowns oe or Machines running at same rate oe or All machines run for the same time oe	1	Examiner's Comments Parts (a) and (b) were often well answered. Some candidates clearly knew how to use their calculators to work with standard form although many converted to ordinary numbers before calculating. Many candidates answered part (a) correctly with some other candidates gained a method mark for showing the correct division. Common errors were to add the two numbers and halve the result or to multiply the numbers. In part (b) many candidates multiplied the two correct numbers. Common errors were to fail to convert to standard form for the final answer or to use 365 days (rather than 288 given), from not reading the question carefully enough. In part (c)(i), few had a fully correct method. Many divided by 152 or 15 but rarely both. In part (c)(ii) there were a few correct assumptions seen, such as "no machine broke down".
			Total	9	