1 (a) Write 2.46×10^6 as an ordinary number.

.....

(1)

(b) Write 0.000 74 in standard form.

.....

(1)

(c) Work out $(5.6 \times 10^6) + (2.3 \times 10^5)$

.....

(2)

(Total for Question 1 is 4 marks)

2 (a) Write 5.7×10^{-3} as an ordinary number.

.....

(1)

(b) Write 800 000 in standard form.

.....

(1)

(c) Work out $\dfrac{3 \times 10^5 - 2.7 \times 10^4}{6 \times 10^{-2}}$

.....

(2)

(Total for Question 2 is 4 marks)

---

3 (a) Write 8×10^4 as an ordinary number.

.....

(1)

(b) Work out $(3.5 \times 10^5) \div (7 \times 10^8)$
Give your answer in standard form.

.....

(2)

(Total for Question 3 is 3 marks)

4 (a) Write 5.7×10^6 as an ordinary number.

.....

(1)

(b) Write 0.004 in standard form.

.....

(1)

(c) Work out $\dfrac{2 \times 10^4 + 3 \times 10^5}{6.4 \times 10^{-2}}$

.....

(2)

(Total for Question 4 is 4 marks)

5 (a) Write 5×10^4 as an ordinary number.

.....

(1)

(b) Write 0.000 06 in standard form.

.....

(1)

(c) Work out $(4 \times 10^{512}) \div (1.6 \times 10^{700})$
Give your answer in standard form.

.....

(2)

(Total for Question 5 is 4 marks)

6 (a) Write 0.000 089 in standard form.

.....

(1)

(b) Write 8.34×10^4 as an ordinary number.

.....

(1)

(Total for Question 6 is 2 marks)

---

7 (a) Write 1 390 000 in standard form.

.....

(1)

(b) Write 0.005 in standard form.

.....

(1)

(Total for Question 7 is 2 marks)

8 (a) Write down the value of y^0

.....

(1)

(b) Work out $\dfrac{9.6 \times 10^{141} + 6.4 \times 10^{140}}{3.2 \times 10^{16}}$

Give your answer in standard form.

.....

(3)

(Total for Question 8 is 4 marks)

---

9 (a) Write 2 840 000 000 in standard form.

.....

(1)

(b) Write 2.5×10^{-4} as an ordinary number.

.....

(1)

(Total for Question 6 is 2 marks)

10 (a) Write $\times 10^{7.48}$ as an ordinary number.

.....

(1)

(b) Work out $\dfrac{5.6 \times 10^4 + 7 \times 10^3}{2.8 \times 10^{-3}}$

Give your answer in standard form.

.....

(2)

(Total for Question 10 is 3 marks)

---

11 (a) Write 840 000 in standard form.

.....

(1)

(b) Work out $(6 \times 10^7) \div (8 \times 10^{-2})$
Give your answer in standard form.

.....

(2)

(Total for Question 11 is 3 marks)

12 $a = 4.2 \times 10^{-24}$ $b = 3 \times 10^{145}$

Work out the value of $a \times b$
Give your answer in standard form.

.....

(Total for Question 12 is 2 marks)

13 The table gives the length of the coastline, in kilometres, of each of five oceans.

Ocean	Length of coastline (km)
Arctic	4.539×10^4
Atlantic	1.119×10^5
Pacific	1.357×10^5
Indian	6.653×10^4
Southern	1.797×10^4

(a) Which ocean has the greatest length of coastline?

.....

(1)

(b) Calculate the difference between the length of the Atlantic Ocean's coastline and the length of the Southern Ocean's coastline.
Give your answer in standard form.

..... km

(2)

(Total for Question 13 is 3 marks)

14 The table gives information about the population, correct to 2 significant figures, of each of five cities in 2018

City	Population (2018)
Ahmedabad	7.7×10^6
Barcelona	5.5×10^6
Chicago	8.8×10^6
Lagos	1.3×10^7
Tokyo	3.7×10^7

(a) Write 8.8×10^6 as an ordinary number.

.....

(1)

(b) Which of these cities had the least population in 2018?

.....

(1)

(c) Work out the difference between the population of Tokyo and the population of Ahmedabad in 2018
Give your answer in standard form correct to 2 significant figures.

.....

(2)

(Total for Question 14 is 4 marks)

15 $N = 480 \times 10^9$

(a) Write N as a number in standard form.

(1)

(b) Write N as a product of powers of its prime factors.
Show your working clearly.

(3)

(c) Find the largest factor of N that is an odd number.

(1)

(Total for Question15 is 5 marks)

16 The table shows the volumes, in km^3, of four oceans.

Ocean	Volume (km^3)
Arctic Ocean	1.88×10^7
Atlantic Ocean	3.10×10^8
Indian Ocean	2.64×10^8
Southern Ocean	7.18×10^7

(a) Write 7.18×10^7 as an ordinary number.

(1)

(b) Calculate the total volume of these four oceans.

km^3

(2)

The volume of the South China Sea is $9\,880\,000\,km^3$

(c) Write 9 880 000 in standard form.

(1)

(Total for Question 16 is 4 marks)

17 The table shows the populations of five countries.

Country	Population
China	1.4×10^9
Germany	8.2×10^7
Sweden	9.9×10^6
Fiji	9.1×10^5
Malta	4.3×10^5

(a) Work out the difference between the population of China and the population of Germany.
Give your answer in standard form.

.....

(2)

Given that

$$\text{population of Fiji} = \frac{1}{k} \times \text{population of Sweden}$$

(b) work out the value of k.
Give your answer correct to the nearest whole number.

$k =$ .....

(2)

(Total for Question 17 is 4 marks)

18 A rainwater tank contains 2.4×10^7 raindrops.
The rainwater tank also contains 1.75×10^6 bacteria.

(a) Work out the number of bacteria per raindrop in the tank.
Give your answer in standard form correct to 2 significant figures.

.....

(3)

A drop of rainwater contains 5.01×10^{21} atoms.

In a drop of rainwater the number of atoms is 3 times the number of molecules.

(b) Work out the number of molecules in the rainwater tank.
Give your answer in standard form correct to one significant figure.

..... molecules

(2)

(Total for Question 18 is 5 marks)

19 The table shows information about the surface area of each of the world's oceans.

Ocean	Surface area in square kilometres
Pacific	1.56×10^8
Indian	6.86×10^7
Southern	2.03×10^7
Arctic	1.41×10^7
Atlantic	1.06×10^8

(a) Work out the difference, in square kilometres, between the surface area of the Atlantic Ocean and the surface area of the Indian Ocean.
Give your answer in standard form.

..... square kilometres
(2)

The surface area of the Pacific Ocean is k times the surface area of the Arctic Ocean.

(b) Work out the value of k.
Give your answer correct to the nearest whole number.

$k =$ .....
(1)

(Total for Question 19 is 3 marks)

20 The table gives the average crowd attendance per match for each of five football clubs for one season.

Football club	Average crowd attendance
Monaco	9.5×10^3
Chelsea	4.2×10^4
Juventus	3.9×10^4
Oxford United	8.3×10^3
Barcelona	7.7×10^4

(a) Find the difference between the average crowd attendance for Barcelona and the average crowd attendance for Monaco.
Give your answer in standard form.

.....

(2)

Antonio says,

"The average crowd attendance for Chelsea is approximately 50 times that for Oxford United."

(b) Is Antonio correct?
You must give a reason for your answer.

.....

.....

.....

(2)

During last season the cost of a ticket to watch Seapron United increased by 15% and then decreased by 8%

(c) Work out the overall percentage change in the cost of a ticket to watch Seapron United during last season.

.....%

(2)

(Total for Question 20 is 6 marks)

21 $a = 6 \times 10^{40}$

Work out the value of a^3
Give your answer in standard form.

.....

(Total for Question 21 is 3 marks)

22 $a = 25 \times 10^{14n}$ where n is an integer.

Find an expression, in terms of n, for $a^{\frac{3}{2}}$
Give your answer in standard form.

.....

(Total for Question 22 is 3 marks)