A screenshot of a cell phone

Description automatically generated

**Standard form**

**Instructions**

* Use **black** ink or ball-point pen.
  + **Fill in the boxes** at the top of this page with your name,  
    centre number and candidate number.
* Answer **all** questions.
* Answer the questions in the spaces provided  
  *– there may be more space than you need.*
* You must **show all your working.**
* Diagrams are **NOT** accurately drawn, unless otherwise indicated.
* If your calculator does not have a *π* button, take the value of *π* to be3.142

unless the question instructs otherwise.

**Information**

* The total mark for this paper is **36**. There are **12** questions.
* Questions have been arranged in an ascending order of mean difficulty, as found by all students in the June 2017–November 2019 examinations.
* The marks for **each** question are shown in brackets  
  *– use this as a guide as to how much time to spend on each question.*

**Advice**

1. Read each question carefully before you start to answer it.
2. Keep an eye on the time.
3. Try to answer every question.
4. Check your answers if you have time at the end.

**1** Work out the value of 

Give your answer in standard form.

.......................................................

(**Total for Question 1 is 2 marks**)

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**2** (*a*)Write 4.7 × 10–1 as an ordinary number.

......................................................

**(1)**

(*b*)Work out the value of (2.4 × 103) × (9.5 × 105)

Give your answer in standard form.

..................................................................................

**(2)**

**(Total for Question 2 is 3 marks)**

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**3** Work out (3.42 × 10−7) ÷ (7.5 × 10−6)

Give your answer in standard form.

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**(Total for Question 3 is 2 marks)**

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**4** Work out (13.8 × 107) × (5.4 × 10−12)

Give your answer as an ordinary number.

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**(Total for Question 4 is 2 marks)**

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**5** (*a*)Write 0.00562 in standard form.

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**(1)**

(*b*)Write 1.452 × 103 as an ordinary number.

.......................................................

**(1)**

**(Total for Question 5 is 2 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**6** (*a*)Write the number 0.000 075 47 in standard form.

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**(1)**

(*b*)Write 3.42 × 104 as an ordinary number.

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**(1)**

(*c*)Work out 

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**(2)**

**(Total for Question 6 is 4 marks)**

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**7** (*a*) Write 2.673 × 104 as an ordinary number.

.......................................................

**(1)**

(*b*) Write 0.0704 in standard form.

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**(1)**

(*c*)Calculate (4.515 × 106) ÷ (3.01 × 10−2)

Give your answer in standard form.

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**(2)**

**(Total for Question 7 is 4 marks)**

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**8** (a) Write 340 000 000 in standard form.

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**(1)**

(b)Work out (1.67 × 10−7) ÷ (9.11 × 10−3)

Give your answer as an ordinary number correct to 3 significant figures.

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**(2)**

**(Total for Question 8 is 3 marks)**

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**9** (*a*)Write 32 460 000 in standard form.

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**(1)**

(*b*)Write 4.96 × 10−3 as an ordinary number.

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**(1)**

Asma was asked to compare the following two numbers.

*A* = 6.212 × 108 and *B* = 4.73 × 109

She says,

“6.212 is bigger than 4.73 so *A* is bigger than *B*.”

(*c*)Is Asma correct?

You must give a reason for your answer.

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**(1)**

**(Total for Question 9 is 3 marks)**

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**10** Work out 

Give your answer in standard form.

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**(Total for Question 10 is 3 marks)**

**11** The distance from the Earth to the Sun is 1.496 × 1011 metres.

The speed of light is 3 × 108 metres per second.

(a) Show that, correct to 3 significant figures, light will take 0.139 hours to travel from the Sun to the Earth.

**(3)**

1 googol is 1 × 10100

Danesh says,

When I multiply 1.496 × 1011 by 6.68 × 109

I get nearly 1 googol because 1.496 × 1011 × 6.68 × 109 = 9.99 × 1099

Is Danesh correct?

(b) Give a reason for your answer.

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**(1)**

**(Total for Question 11 is 4 marks)**

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**12** (a) Write 1.04 × 105 as an ordinary number.

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**(1)**

(b) Write 0.06 in standard form.

.......................................................

**(1)**

4.62 × 108 tins of beans were sold last year.

These tins of beans cost a total of £300.3 million.

(c) Work out the average cost per tin of beans.

£.......................................................

**(2)**

**(Total for Question 12 is 4 marks)**

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**TOTAL MARKS FOR PAPER: 36**