

SCIENTIFIC NOTATION AND SIGNIFICANT FIGURES- SOL'NS

1. a) ✓ 6.7×10^2 4×10^{36} 7.61×10^0 -5.24×10^{-8}

✗ 36×10 $\pi \times 10^7$ $2 \times 10^{7.61}$ 0.67×10^3
 382 $\frac{4}{3} \times 10^5$ 7×10 $5 \times 10^{\frac{4}{3}}$

- b) - ONE NON-ZERO DIGIT FOLLOWED BY
A DECIMAL AND ALL REMAINING
SIGNIFICANT FIGURES
- POWER OF 10 WITH AN
INTEGER EXPONENT

2. a) i. 1.99×10^{21} kg ii. 9.11×10^{25} kg

- b) SCIENTIFIC NOTATION MAKES IT
EASIER TO SEE THE MAGNITUDE
OF A VALUE.

c) i. 1.6×10^{-16} C
ii. 5.98×10^{24} kg
iii. 6×10^0 m
iv. $1.000\ 000\ 000\ 000\ 000\ 000\ 000\ 16 \times 10^0$ C

3. 96.74 km
 500 MHz
 227 GB
 8 ns

- | | | | |
|-----------------------|---|---------------------|---|
| 4. 6 340 000 | 3 | 6.310×10^4 | 4 |
| 713 | 3 | 3.95×10^4 | 3 |
| 8.14 | 3 | 52401 | 5 |
| 0.332 | 3 | 67.1 | 3 |
| 0.000 051 | 2 | 11.400 | 5 |
| 1.21×10^{-4} | 3 | 2940 | 3 |
| 12 300 | 3 | 5 240 | 3 |
| 91 400.0 | 6 | 8.000 132 | 7 |
| 48 400 | 3 | 100 | 1 |

- | | | | |
|--------------------------------|---|----------------------------------|---|
| 5. 37.2 m | 3 | 0.000 076 s | 2 |
| 0.80 kg | 2 | 789 mm | 3 |
| 56.02 m | 4 | 5.00 cm | 3 |
| $2999 \times 10^6 \frac{m}{s}$ | 4 | 0.00015 g | 2 |
| 56 cm | 2 | 104.080 J | 6 |
| 301.5 kg | 4 | $5.60 \times 10^2 \frac{s}{m^3}$ | 3 |
| $4.24 \times 10^3 m$ | 3 | 0.050 m | 2 |
| $9.7 \times 10^{-10} m$ | 2 | | |

$$6. \quad 37.2 + 0.12 + 363.55 = 400.9$$

$$362.66 - 29.2 = 333.5$$

$$4005.34 - 325.2600 = 3680.08$$

$$0.00076 - 0.0006000 = 0.00016$$

$$2.4 \times 6.0 = 14$$

$$0.23 \times 0.350 \times 4 = 0.3$$

$$55 \times 0.540 \times 326 = 9900$$

$$0.0060 \times 55.1 \times 26 = 8.6$$

$$\frac{750}{3.1} = 240$$

$$\frac{0.94 \times 720}{4.4} = 150$$

$$7. \quad \begin{array}{llll} \text{a)} & 3 & \text{d)} & 2 \\ \text{b)} & 3 & \text{e)} & 2 \\ \text{c)} & 2 & \text{f)} & 3 \\ & & \text{g)} & 2 \\ & & \text{h)} & 4 \\ & & \text{i)} & 1 \\ & & \text{j)} & 2 \end{array}$$

$$8. \quad \begin{array}{ll} \text{a)} & 5.808 \times 10^3 \\ \text{b)} & 6.3 \times 10^{-5} \\ \text{c)} & 5.3 \times 10^3 \\ \text{d)} & 2.997928 \times 10^{10} \\ \text{e)} & 9.13 \times 10^{-10} \\ \text{f)} & 6.030 \times 10^{-2} \\ \text{g)} & 3 \times 10^{10} \\ \text{h)} & 7.0 \times 10^{-1} \\ \text{i)} & 5.8 \times 10^1 \\ \text{j)} & 4 \times 10^0 \end{array}$$

$$9. \quad \begin{array}{ll} \text{a)} & 60 \\ \text{b)} & 6200 \\ \text{c)} & 7\,400\,000\,000 \\ \text{d)} & 0.091 \\ \text{e)} & 436700 \\ \text{f)} & 430 \end{array}$$

10. a) 400.9

b) 333.5

c) 3680.08

d) 0.00016

e) 14

f) 0.32

g) 9700

h) 8.6

i) 256

j) 77

k) 32

l) 0.56

m) 150

n) 600

o) 6.2 ROUND DOWN FROM 6.25

p) 2.2

q) 12.7

r) 440

s) 1200

t) 0.6

11. a) 10^2

b) 10^5

c) 10^4

d) 10^{-3}

e) 10^{-2}

f) 10^{-4}

g) 10^{-7}

h) 10^1

i) 3.9×10^3

j) 2×10^3

k) 2×10^2 2.1×10^2 ROUNDED TO ONE S.F.

12. a) 1 MV

b) 1 μ m

c) 0.5 kilodays

d) 8 kilobucks

e) 3×10^{-9} nanopieces

f) 66.7 picofreaks

13. a) $35.6 \text{ mm} = 35.6 \times 10^{-3} \text{ m}$
 $= 0.0356 \text{ m}$

b) $25 \text{ ns} = 25 \times 10^{-9} \text{ s}$
 $= 0.000\ 000\ 025 \text{ s}$

c) $250 \text{ mg} = 250 \times 10^{-3} \text{ g}$
 $= 0.25 \text{ g}$

d) $565 \text{ nm} = 565 \times 10^{-9} \text{ m}$
 $= 0.000\ 000\ 565 \text{ m}$

e) $3.2 \times 10^{-6} \text{ TA} = 3.2 \times 10^{-6} \times 10^{12} \text{ A}$
 $= 3.2 \times 10^6 \text{ A}$
 $= 3\ 200\ 000 \text{ A}$

f) $500 \text{ ps} = 500 \times 10^{-12} \text{ s}$
 $= 0.000\ 000\ 000\ 5 \text{ s}$

g) $2.5 \text{ fm} = 2.5 \times 10^{-15} \text{ m}$
 $= 0.000\ 000\ 000\ 000\ 000\ 0025 \text{ m}$

h) $25 \text{ GV} = 25 \times 10^9 \text{ V}$
 $= 25\ 000\ 000\ 000 \text{ V}$

i) $56 \text{ dag} = 56 \times 10^1 \text{ g}$
 $= 560 \text{ g}$

NOT USED FOR
 DETERMINING S.F.

14. $1 \text{ yr} \times \frac{365 \text{ days}}{\text{yr}} \times \frac{24 \text{ h}}{\text{day}} \times \frac{60 \text{ min}}{\text{h}} \times \frac{60 \text{ s}}{\text{min}} \times \frac{3.00 \times 10^8 \text{ m}}{\text{s}}$
 $= 9.46 \times 10^{15} \text{ m}$

15. # BALLS = $\frac{V_{\text{BALL}}}{V_{\text{LAB}}}$ ASSUMING ALL EMPTY SPACE IS FILLED.

$$= \frac{1.0 \times 10^{-4}}{(15.2)(8.2)(3.1)}$$

$$= 0.000\ 000\ 26 = 2.6 \times 10^{-7}$$

16. $A_{\text{circle}} = \pi r^2$
 $= \pi (2.8 \times 10^4)^2$
 $= 2.5 \times 10^9 \text{ cm}^2$

17. a) $7 \frac{\text{m}}{\text{s}}$
b) $20 \text{ kg} \frac{\text{m}}{\text{s}}$
c) $373 \frac{\text{m}}{\text{s}^2}$

d) $2.419 \frac{\text{cm}}{\text{s}}$
e) $0.85 \text{ AV} = 0.85 \text{ W}$
f) 1.1 N

REMEMBER
 $P = IV$
UNITS: $\begin{matrix} \uparrow & \uparrow & \uparrow \\ \text{W} & \text{A} & \text{V} \end{matrix}$