

①

name- Jay Patel

Homework-1 [7,8,16,21,25,41]

Classical physics-1 (210)

Section-Online (Professor Huett, Van) OLO1

Q7] To add values with significant figures, adjust all values to be added so that their exponents are all the same

$$\begin{aligned} & (9.2 \times 10^3 \text{ s}) + (8.3 \times 10^4 \text{ s}) + (0.008 \times 10^6 \text{ s}) \\ &= (9.2 \times 10^3 \text{ s}) + (83 \times 10^3 \text{ s}) + (8 \times 10^3 \text{ s}) \\ &= (9.2 + 83 + 8) \times 10^3 \text{ s} = 100 \times 10^3 \text{ s} = \boxed{1.00 \times 10^5 \text{ s}} \end{aligned}$$

Q8]  $(2.079 \times 10^2 \text{ m}) (0.082 \times 10^{-1}) = \boxed{1.7 \text{ m}}$

when multiplying result should have as many digits with least number of significant.

Q16] Use the speed of the airplane to convert the travel distance into a time.  $d = vt$ , so  $t = d/v$

$$t = d/v = 1.00 \text{ km} \left( \frac{1 \text{ h}}{950 \text{ km}} \right) \left( \frac{3600 \text{ s}}{1 \text{ h}} \right) = \boxed{13.85}$$

Q21] a] Find the distance by multiplying the speed of the time.

$$\begin{aligned} 1.00 \text{ ly} &= (2.998 \times 10^8 \text{ m/s}) (3.156 \times 10^7 \text{ s}) = 9.462 \times 10^{15} \text{ m} \\ &= \boxed{9.46 \times 10^{15} \text{ m}} \end{aligned}$$

b] Unit conversion from ly to AU

$$(1.00 \text{ ly}) \left( \frac{9.462 \times 10^{15} \text{ m}}{1.00 \text{ ly}} \right) \left( \frac{1 \text{ AU}}{1.50 \times 10^{11} \text{ m}} \right) = \boxed{6.31 \times 10^4 \text{ AU}}$$

$$c) (2.998 \times 10^8 \text{ m/s}) \left( \frac{1 \text{ AU}}{1.50 \times 10^{11} \text{ m}} \right) \left( \frac{3600 \text{ s}}{1 \text{ hr}} \right) = \boxed{7.20 \text{ AU/hr}}$$

25) Textbook is approx 25 cm deep & 5 cm wide. Shelf should have 50 cm deep. Its aisle is 1.5 m wide then about  $\frac{1}{4}$  floor is covered

$$\frac{1}{4} (3500 \text{ m}^2) \left( \frac{1 \text{ book}}{(0.25 \text{ m})(0.05 \text{ m})} \right) = 7.0 \times 10^4 \text{ books}$$

with 8 shelf of books stored

$$\left( \frac{7.0 \times 10^4 \text{ books}}{\text{shelf level}} \right) (8 \text{ shelves}) = \boxed{6 \times 10^5 \text{ books}}$$

4) a) number of seconds in 1.00 y:

$$1.00 \text{ y} = (1.00 \text{ y}) \left( \frac{3.156 \times 10^7 \text{ s}}{1 \text{ y}} \right) = \boxed{3.16 \times 10^7 \text{ s}}$$

b) number of nanoseconds in 1.00 y

$$1.00 \text{ y} = (1.00 \text{ y}) \left( \frac{3.156 \times 10^7 \text{ s}}{1 \text{ y}} \right) \left( \frac{1 \cdot 10^9 \text{ ns}}{1 \text{ s}} \right) = \boxed{3.16 \times 10^{16} \text{ ns}}$$

c) number of years in 1.00 s:

$$1.00 \text{ s} = (1.00 \text{ s}) \left( \frac{1 \text{ y}}{3.156 \times 10^7 \text{ s}} \right) = \boxed{3.17 \times 10^{-8} \text{ y}}$$