



General Studies Department

Course Code: PHYS 111 Title: General Physics I Semester: 471

CH_1_Q (Measurement)

Tutorial Problems:

Q1. Problem No: 7 Page No: 9

Assume the legal limit of speed is 70.0 mi/h. If driving day and night without stopping for 1.00 year, what is the maximum number of miles one can drive?

Solution:

$$1 \times 365 \times 24 \times 70 = 613200 \text{ mile}$$

Q2. Problem No: 21 Page No: 9

A ²3.5 cm³ volume is occupied by a wood piece of mass ³9.05 g. Find the density of this piece of wood, taking significant figures into consideration.

Solution:

$$\rho = \frac{m}{V} = \frac{9.05}{3.5} = 2.5857 = 2.6 \frac{\text{g}}{\text{cm}^3} \text{ S.F.}$$



Self-Study Problems:

Q1. Problem No: 1 Page No: 8

A volume of 231 cubic inches makes 1.00 US fluid gallon. To fill a 14.0 gallon tank, how many liters (L) of gasoline are required? [Note: $1.00 \text{ L} = 10^3 \text{ cm}^3$]

Solution:

$$\begin{aligned}
 231 \text{ in}^3 &= 1 \text{ gallon} \\
 1 \text{ L} &= 10^3 \text{ cm}^3 \\
 14 \text{ gal} &\times \frac{231 \text{ in}^3}{1 \text{ gal}} \times \frac{(2.54 \text{ cm})^3}{(1 \text{ in})^3} \times \frac{1 \text{ L}}{10^3 \text{ cm}^3} \\
 &= 53 \text{ L}
 \end{aligned}$$

Q2. Problem No: 3 Page No: 8

How many m/s are there in 1.0 mi/h? (1 mile = 1.609 km 1609 m)

Solution:

$$\begin{aligned}
 \frac{1 \text{ mi}}{1 \text{ hr}} &\times \frac{1 \text{ hr}}{60 \times 60 \text{ s}} \times \frac{1609 \text{ m}}{1 \text{ mi}} \\
 &= 0.45 \text{ m/s}
 \end{aligned}$$



Q3. Problem No: 23 Page No: 10

A $2.00\text{ m} \times 3.00\text{ m}$ plate of aluminium has a mass of 324 kg. What is the thickness of the plate? (The density of aluminium is $2.70 \times 10^3\text{ kg/m}^3$.)

Solution:

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Revision ch1 part 1
Min 24:30

Q4. Problem No: 26 Page No: 10

The mass and volume of a body are 5.324 g and 2.5 cm^3 , respectively. What is the density of the material of the body?

Solution:

$$\rho = \frac{m}{V} = \frac{5.324}{2.5} = 2.13 \frac{\text{g}}{\text{cm}^3}$$



Q5. Problem No: 27 Page No: 10

A grocer's balance shows the mass of an object as 2.500 kg. Two gold pieces of masses 21.15 g and 21.17 g are added to the box. What is (a) the total mass in the box and (b) the difference in the masses of the gold pieces to the correct number of significant figures?

Solution:

$$m_1 = 2.500 \text{ kg}$$

$$m_2 = 21.15 \text{ g} = 0.02115 \text{ kg}$$

$$m_3 = 21.17 \text{ g} = 0.02117 \text{ kg}$$

$$\text{a) } m_{\text{t}} = m_1 + m_2 + m_3$$

$$= 2.500 + 0.02115 + 0.02117$$

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$$= 2.54232 = 2.542 \text{ kg}$$

$$\text{b) } 21.17 - 21.15 = 0.02 \text{ g}$$