

Quiz #4 Chapter 3 2019 Name: \_\_\_\_\_

Answer each question in the space provided. **ROUND TO WHOLE #S**  
 Make sure to you show your work, the formulas each time, #s used and answer with appropriate units.

1. What is the energy efficiency of a machine that consumes 15 610 J to perform work equal to 10 344 J? (2)

$$\% EE = \frac{\text{useful}}{\text{consumed}} \times 100$$

$$= \frac{10\,344\text{ J}}{15\,610\text{ J}} \times 100$$

66%

$\% EE = 66\%$

2. A machine with an energy efficiency of 76% provides 75 500J of useful energy. What is the amount of energy this machine consumed? (2)

$$\frac{\% EE}{100} = \frac{\text{useful}}{\text{consumed}}$$

$$\frac{76}{100} = \frac{75\,500\text{ J}}{x}$$

99 342 J

3. What is the energy efficiency of a table lamp that produces 16 700 J of luminous energy, 3 400 J of vibrational energy and 7 200 J of heat energy? (2)

total (consumed)

16 700
3 400
7 200
27 300 J

$$\% EE = \frac{\text{useful}}{\text{consumed}} \times 100$$

$$= \frac{16\,700}{27\,300} \times 100$$

$\% EE = 61\%$

↑ useful

61%

4. What is the speed in km/h of a car that travels 38 500 m in 33 minutes? (2)

$$V = \frac{d}{t} = \frac{38.5}{0.55} = 70 \text{ km/h}$$

↳ ÷ 1000 = 38.5 km

time  $\frac{33}{60} = 0.55\text{ h}$

70 km/h

5. How many minutes does it take for light to travel from the sun to earth? Light travels at a speed of 300 000 km/s and the sun is approximately 149 600 000 km away. (2)

$$V = \frac{d}{t}$$

$\triangle$   
 $\frac{d}{v \cdot t}$

$$t = \frac{d}{v} = \frac{149\,600\,000\text{ km}}{300\,000\text{ km/s}} = 498.6\text{ s}$$

or

$$\frac{V}{1} = \frac{d}{t}$$

$$\frac{300\,000}{1} = \frac{149\,600\,000}{t} \quad t = 498.6\text{ s}$$

↓

$$\frac{498.6}{60} = 8.31\text{ min}$$

↑

8 min 19 s