**Quiz 2 Chemical Principles I Chem 1984 Fall 2013**

**Metric-Metric conversions, wave equation, Planck’s equation \_\_\_\_\_/30**

**Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2.1. Metric-metric conversions (3 pts each/9 pts total)**

**Convert:**

**10 ms 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_cs**

**0.23 ng 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pg**

**400 km 🡪 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Mm**

**2.2. Waves and the Wave equation ( 5 pts total)**

 **8 cm**

For the light wave drawn :

1. **Compute the wavelength λ in meters (m): λ= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m (2 pts)**
2. **Compute the frequency f in GHz:**

 **f= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ GHz (3 pts)**

 (assume c=3\*108 m/s)

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**2.3. frequency- wavelength conversions (4 pts each/8 pts total)**

Given that c=3\*108 m/s, convert the following frequencies or wavelengths to their equivalent wavelengths or frequencies in the units indicated.

1. **600 MHz** 🡪 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm (4 pts)**
2. **100 mm** 🡪 **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ GHz (4 pts)**

**2.4. Planck’s law computations: ( 4 pts each/8 pts total)**

Given that**: E (J) /photon = 6.63\*10-34 \*f(Hz) =1.989\*10\_25 /λ(m)**

1. Compute the energy of a 150.8 GHz photon in Joules (J) : **E/photon = \_\_\_\_\_\_\_\_\_\_\_\_\_\_J (2 sig figs)**
2. A photon has 3.978\*10-26 J of energy. What is its’ wavelength in meters ?

 **λ=\_\_\_\_\_\_\_\_\_\_\_\_\_ m (2 sig figs)**