

Answers

1. **Circle** the color of light with the lowest energy: (1 point)

red

2. **Circle** the color of light with the smallest frequency: (1 point)

red

3. Match the names on the left with their scientific discovery on the right: (1 point each)

a

b

d

c

e

4. Use the diagram below to answer the following questions: (2 points)

II

I

5. Use the information below to answer the following questions. (2 points) *Use 1s, 2p, 3d, etc. for your answers.*

What type of orbital is designated $n = 2, l = 0, m_l = 0$? **2s**

What type of orbital is designated $n = 4, l = 1, m_l = -1$? **4p**

6. If the de Broglie wavelength of an electron is 112 nm, what is its velocity in m/s? The mass of an electron is 9.11×10^{-31} kg. (5 points) (*Note to physics fans: no relativity in this problem!*)

6490 m/s

7. If an FM radio station operates at a frequency of 92.3 megahertz (MHz, or 92.3×10^6 Hz), calculate the **wavelength** of its signal in meters and the **energy** of one photon in Joules. (4 points) (+1 bonus if you can name the Portland-area radio station using this information! ☺)

3.25 m

6.12×10^{-26} J