30: In the Bohr model of the hydrogen atom, precisely what is quantized?

32: What is the maximum wavelength of light capable of removing an electron from a hydrogen atom in the energy state characterized by \( n=1 \) and \( n=3 \)?

34: Does a photon of visible light (\( \lambda = 400-700 \text{ nm} \)) have sufficient energy to excite an electron in a hydrogen atom from the \( n=1 \) to the \( n=5 \) energy state? From the \( n=2 \) to the \( n=6 \) energy state?

36b: Calculate the deBroglie wavelength for an electron with a velocity 15\% the speed of light. (What is the significance of the deBroglie wavelength for an electron? Perhaps, compare your answer to that of part c.)

42: Calculate the wavelength of the electromagnetic radiation required to excite an electron from the ground state to the level with \( n=5 \) in a one-dimensional box 40.0 pm in length.

50: Which of the following sets of quantum numbers for the H atom are not allowed in the hydrogen atom? For the sets of quantum numbers that are incorrect state what is wrong:

\( f: n=4, l=3, m=4 \)

\( g: n=0, l=0, m=0 \)

\( h: n=2, l=-1, m=1 \)