

PROBLEM SETS (Levine, Quantum Chemistry)

	4 th Edition	5 th Edition
Chapter 1:	1.11, 1.19	1.12, 1.22
Chapter 2:	2.2, 2.4, 2.5, 2.11	2.2, 2.5, 2.7, 2.15
Chapter 3:	3.19 (a,b), 3.23 (a,b), 3.33, 3.36	3.23 (a,b), 3.27 (a,b), 3.36, 3.39
Chapter 4:	4.11, 4.15, 4.16, 4.17, 4.19, 4.21, 4.24, 4.27	4.12, 4.16, 4.17, 4.18, 4.20, 4.22, 4.24, 4.27
Chapter 5:	5.9, 5.13 (b), 5.23, 5.24	5.9, 5.14 (b), 5.24, 5.25
Chapter 6:	6.5, 6.16, 6.17, 6.31, 6.34	6.5, 6.17, 6.18, 6.30, 6.34
Chapter 7:	7.5, 7.8, 7.15, 7.24, and:	7.6, 7.9, 7.17, 7.26, and:

7.28 (3rd Ed.) Consider a particle in a nonstationary state in a one-dimensional box of length L with infinite walls. Suppose at time t_0 its state function is the parabolic function

$$\Psi(t_0) = N x (L-x) \quad 0 \leq x \leq L$$

where N is the normalization constant. If at time t_0 we were to make a measurement of the particle's energy, what would be the possible outcomes of the measurement & what would be the probability for each such outcome?

Chapter 8:	8.12, 8.25, and	8.14, 8.27, and:
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8.1 (3rd. Ed.) For the ground state of the harmonic oscillator, use the trial variation function

$$\phi = \exp(-bax^2)$$

and show that minimization of the variational integral gives $b = 1/2$ and that $E_0 \leq \hbar\nu/2$.

Chapter 9:	9.1	9.1
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