

7-2)

$$E = \frac{\hbar^2}{2m} \pi^2 \left(\frac{n_1^2}{L^2} + \frac{n_2^2}{L^2} + \frac{n_3^2}{L^2} \right)$$

$$= \frac{\hbar^2 \pi^2}{2mL^2} \left(n_1^2 + \frac{n_2^2}{4} + \frac{n_3^2}{9} \right)$$

$$\psi \quad E_{1,1,1} = E_0 \left(1 + \frac{1}{4} + \frac{1}{9} \right) = 1.361 E_0$$

	n_1	n_2	n_3	E
2	1	1	2	1.694
3	1	2	1	2.111
4	1	1	3	2.250
5	1	2	2	2.440
6	1	2	3	3.000
7	1	1	4	3.028
8	1	3	1	3.360
9	1	3	2	3.472
10	1	2	4	3.778

7-3) a) $\psi = A \cos\left(\frac{n_1 \pi x}{L}\right) \sin\left(\frac{n_2 \pi y}{L}\right) \sin\left(\frac{n_3 \pi z}{L}\right)$

b) ENERGY IS UNCHANGED

7-4) $\psi_{111} = A \sin\left(\frac{\pi x}{L}\right) \sin\left(\frac{\pi y}{2L}\right) \sin\left(\frac{\pi z}{3L}\right)$

$$\psi_{112} = A \sin\left(\frac{\pi x}{L}\right) \sin\left(\frac{\pi y}{2L}\right) \sin\left(\frac{2\pi z}{3L}\right)$$

$$\psi_{121} = A \sin\left(\frac{\pi x}{L}\right) \sin\left(\frac{\pi y}{L}\right) \sin\left(\frac{\pi z}{3L}\right)$$