

7-6 a) $l=3 \Rightarrow L^2 = 3(3+1)\hbar^2 = 12\hbar^2$

$$|L| = \sqrt{12}\hbar$$

b) $m=0, \pm 1, \pm 2, \pm 3 \Rightarrow 7$ z states

c) $\cos \theta = \frac{m_z}{\sqrt{l(l+1)}} \quad (7.13)$

So

$m=0$ has $\cos \theta = 0$, or $\theta = \pi/2$

$m=\pm 1$ has $\cos \theta = \frac{\pm 1}{\sqrt{12}}$, or $\theta =$

$m=\pm 2$ has $\cos \theta = \frac{\pm 2}{\sqrt{12}}$, or $\theta =$

$m=\pm 3$ has $\cos \theta = \frac{\pm 3}{\sqrt{12}}$, or $\theta =$

d) No: n does not appear in the Y_{lm} states, so it has no effect (separation of variables)