PHYS315

A hydrogen atom is in the Ψ 5d state.

(a) What is the principle quantum number/	5
(b) Find the energy of the atom.	<u>0.54</u> eV
(c) What is the value of the orbital quantum number?	2
(d) What is the value of the orbital angular momentum L ?	$\underline{}^{1/2} \underline{\hbar}$
(e) How many magnetic states exist?	5

(e) What are the possible values of the magnetic quantum number

m_{ℓ} +2 +1 0 -1 -2	m _e	+2	+1	0	-1	-2		
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(f) In the largest m_{ℓ} state, what is the angle that angular momentum vector makes with the z-axis?

$L = 2.45 \hbar$ $Lz = 2 \hbar$	<u>_38°</u> degrees
$\cos \theta = 2/2.45 = 0.787$	
$\theta = 38^{\circ}$	

QUIZ #3