The l Quantum Number

The quantum number m reflects the component of angular momentum about a given axis.

$$L_z = m\hbar \text{ where } m = 0, \pm 1, \pm 2, \ldots$$

In the angular wave function $\psi_{lm}(\theta,\phi)$
the quantum number l tells us the total angular momentum L.

$L^2 = L_x^2 + L_y^2 + L_z^2$ is also quantized. The possible values of L^2 are:

$$L^2 = l(l+1)\hbar^2 \text{ where } l = 0, 1, 2, \ldots$$

Wave functions can be eigenstates of both L^2 and L_Z.
For spherically symmetric potentials, like H-atom, they can also be eigenstates of E. Such states are called "orbitals".

Summary of quantum numbers for the H-atom orbitals:

Principal quantum number:	n = 1, 2, 3, ….
Orbital quantum number:	l = 0, 1, 2, …, n-1
Orbital 'magnetic' quantum number:	m = -l, -(l-1), … 0, … (l-1), l