(ii) Azimuthal or Subsidiary Quantum number (l) — It refers to the subshell or sub level to which an electron belongs ~~that~~ and describes the motion of the electron. The magnitude of the angular momentum of an electron (angular velocity x moment of inertia) is related to l by the expression:

Angular momentum $= \sqrt{l(l+1)}\frac{h}{2\pi}$
Where $l = 0, 1, 2, 3 \ldots (n-1)$

This means that the value of l for the subshells of a shell are governed by n, when n=1, there is only one subshell, with the value l=0, when n=2 there are two subshells with the values l=0, 1. When n=3, there are three subshells that have the values l=0, 1, 2, Similarily when n=4 number of ~~shell~~ subshells are 4 with values l=0, 1, 2, 3. For every value of l, there is separate notation to indicate subshell. For example

Q no. l = 0, 1, 2, 3, 4, ....
Subshell Notation = s, p, d, f, g, h ...
The first four notations:

s, p, d, f are adjectives used earlier to identify spectral lines sharp, principal, diffuse and fundamental but subsequent notations used for $l > 3$ proceed alphabatically e.g g, h, i, j ... so on.

Knowing the value of n and finding out l, we designate a subshell. To enumerate subshell with n=1, l=0 is called 1s subshell and others are give as under

| n | l | subshell notation |
|---|---|---|
| 1 | 0 | 1s |
| 2 | 0 | 2s |
| | 1 | 2p |
| 3 | 0 | 3s |
| | 1 | 3p |
| | 2 | 3d |
| 4 | 0 | 4s |
| | 1 | 4p |
| | 2 | 4d |
| | 3 | 4f |

(iii) Magnetic Quantum number(m):-
Each subshell is comprised of one or more orbits (region with maximum probability of finding the electron) whose number is

equal to the number of ways the electrons in a subshell can orient themselves in space. The number of orientations is given by $2l+1$. Thus the number of orientations or orbitals is one when $l=0$ (s-subshell), three for $l=1$ (p-sub shell) five for $l=2$ (d-subshell) and seven for $l=3$ (f-subshell).

In other words s-sub shell has one s-orbital, p-subshell has three p-orbitals, d-subshell has five d-orbitals and so on.

In the absence of electric and magnetic field, these orbitals in a subshell are degenerate, that is, they have identical energy. For example for $l=1$, the three orbitals $p_x$, $p_y$ and $p_z$ are degenerate but this degeneracy is split in the presence of a magnetic field.