triplet spin state is symmetrical and noticing that wave function of a system consisting similar fermions is antisymmetric then the spacial part of wave function must be symmetric. Like this

$$\psi(x_1, x_2) = \frac{1}{\sqrt{2}}\left[\psi_{n_1}(x_1)\psi_{n_2}(x_2) - \psi_{n_1}(x_2)\psi_{n_2}(x_1)\right]\chi_{triplet}(\overrightarrow{S_1}, \overrightarrow{S_2}) \qquad (*)$$

$\psi_n(x)$ is the nth harmonic wave function. so, the energy for the system is:

$$E_{n_1 n_2} = \sum_{i=1}^{2}\left[\hbar\omega\left(n_i + \frac{1}{2}\right)\right] = \hbar\omega(n_1 + n_2 + 1)$$

Now let's investigate the ground, first excitation, and second excitation states. Before continue according to (*) it is obvious that n_1 and n_2 must have different values.

If we show wave function and ground state energy by $\psi^{(0)}$ and $E^{(0)}$ respectively, knowing that ground state corresponds to the case which one particle is in each ψ_0 and ψ_1 then we can say that:

$$\psi^{(0)}(x_1, x_2) = \frac{1}{\sqrt{2}}[\psi_0(x_1)\psi_1(x_2) - \psi_1(x_1)\psi_0(x_2)]\chi_{triplet}(\overrightarrow{S_1}, \overrightarrow{S_2})$$

As $\chi_{triplet}(\overrightarrow{S_1}, \overrightarrow{S_2})$ has three independent states, the ground state does have triplet degeneracy and energy equivalent to that can obtain from this relation:

$$E^{(0)} = E_{10} = E_{01} = \hbar\omega(0 + 1 + 1) = 2\hbar\omega$$

Similar to this if we show wave function and the first excitation state energy by $\psi^{(1)}$ and $E^{(1)}$ respectively, knowing that the first excitation state corresponds to the case which one particle is in each ψ_0 and ψ_2 then we can say that:

$$\psi^{(1)}(x_1, x_2) = \frac{1}{\sqrt{2}}[\psi_0(x_1)\psi_2(x_2) - \psi_2(x_1)\psi_0(x_2)]\chi_{triplet}(\overrightarrow{S_1}, \overrightarrow{S_2})$$

$$E^{(1)} = \hbar\omega(0 + 2 + 1) = 3\hbar\omega$$

We have triplet degeneracy in here also.

There is something different in second excitation state. If we show the energy of this state by $E^{(2)}$ we have

$$E^{(2)} = 4\hbar\omega$$

This happens in two cases:

1. One of two particle is in ψ_0 state and the other in ψ_3 in which we have
$$\psi^{(2)}{}_1 = \frac{1}{\sqrt{2}}[\psi_0(x_1)\psi_3(x_2) - \psi_3(x_1)\psi_0(x_2)]\chi_{triplet}(\overrightarrow{S_1}, \overrightarrow{S_2})$$
$\psi^{(2)}{}_1$consists from three independent states.
2. One of two particle is in ψ_1 state and the other in ψ_2 in which we have
$$\psi^{(2)}{}_2 = \frac{1}{\sqrt{2}}[\psi_1(x_1)\psi_2(x_2) - \psi_2(x_1)\psi_1(x_2)]\chi_{triplet}(\overrightarrow{S_1}, \overrightarrow{S_2})$$

$\psi^{(2)}{}_2$consists from three independent states.
Then according to explanations above second excitation state with eigen functions $\psi^{(2)}{}_1$ and $\psi^{(2)}{}_2$ and energy equal to $E^{(2)}$does have sextuplet degeneracy.