

Solution

For a cubical box, we just saw that the 5th energy level is at $12 E_0$, with a degeneracy of 1 and quantum numbers (2,2,2).

1. What is the energy of the next energy level?

- a. $13E_0$ **b. $14E_0$** c. $15E_0$

$$E_{1,2,3} = E_0 (1^2 + 2^2 + 3^2) = 14 E_0$$

2. What is the degeneracy of this energy level?

- a. 2 b. 4 **c. 6**

Any ordering of the three numbers will give the same energy. Because they are all different (distinguishable), the answer is $3! = 6$.

Question:

Is it possible to have $D > 6$?

Hint: Consider $E = 62E_0$.