

- 1
 - in paper
- 2
 - a
 - in paper
 - b
 - The photon is absorbed, so all of its energy will be transferred into the hydrogen atom, meaning there can be no room for error as the electrons in the hydrogen atom need a specific amount of energy to reach each energy level. The free electron collision is different in that the free electron sticks around after the collision, and so can keep the excess energy to itself and give the exact amount to the hydrogen atom.
 - c
 - in paper
 - d
 - in paper
- 3
 - a-d
 - in paper
 - e
 - Particle X has a strange quark, which is not conserved in the equation, therefore it must be the weak interaction because it is the only interaction that does not conserve strangeness.
 - f
 - in paper
- 4-17
 - in paper