Question (5 pts):

As we discussed, the transition rates describing absorption and emission are essentially the same if the problem of interaction between the matter and radiation is treated semi-classically. By comparing matrix elements describing absorption and emission in the case of the fully-QM treatment, compare the absorption and emission transition rates obtained via second quantization. Discuss the result: (i) what is different between absorption and emission rates? (b) how can the fully-QM result be related to the semi-classical result?