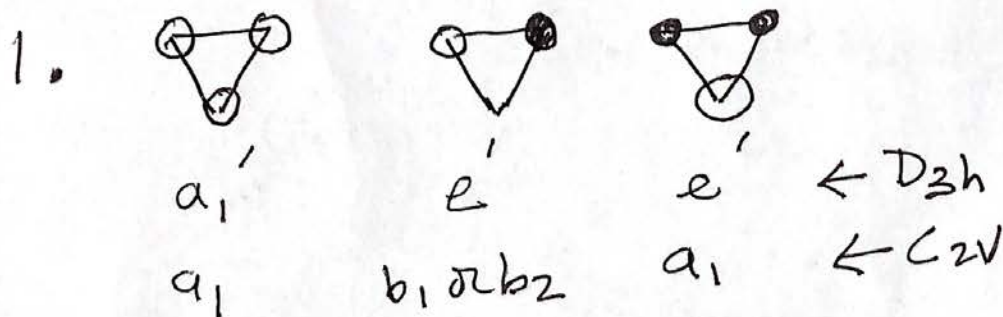


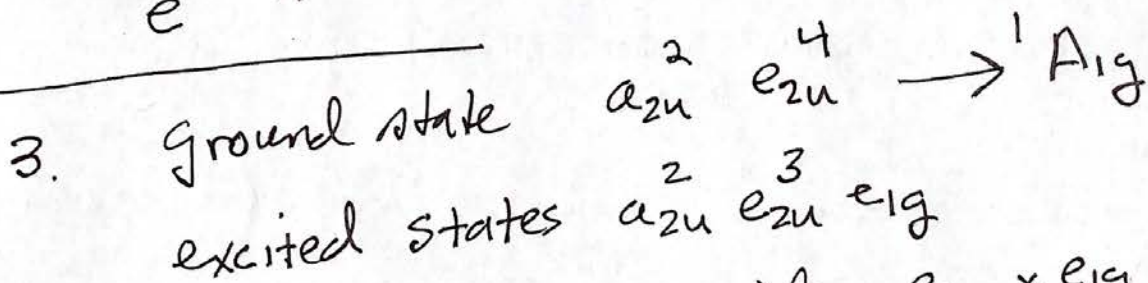
# HW #8 Answers



$\hookrightarrow$  depending on orientation of axes

2. The integral involves  $e^{-\alpha \sqrt{x^2 + y^2 + z^2}}$ .

$e^{-\alpha \sqrt{x^2 + y^2 + (z-R)^2}}$



So we need to consider  $e_{2u} \times e_{1g}$

This tells us that there are  $B_{1u}$ ,  $B_{2u}$ , and  $E_{1u}$  electronically excited states. In each case there is a singlet and a triplet spin state.

From the point group character table we see that  $(x, y)$  transform according to the  $E_{1u}$  representation and  $z$  according to the  $A_{2u}$  representation. So the  ${}^1E_{2u}$  would be dipole allowed, but  ${}^1B_{1u}$  and  ${}^1B_{2u}$  are dipole forbidden.