Marks
2

Giving reasons, order either the set of oxyacids or the binary acids in terms of increasing acidity.

$HClO$, $HClO_2$, $HClO_3$, $HClO_4$ or H_2O, H_2S, H_2Se, H_2Te

All $HClO_n$ acids have the structure $HOClO_{n-1}$. As the number of oxygens increases, more electron density is drawn away from the O–H bond and weakens it. The weaker the O–H bond, the stronger the acid, so the order is $HClO < HClO_2 < HClO_3 < HClO_4$.

In binary acids such as H_2S and H_2Se, the H–Se bonds is longer than the H–S bonds as Se is larger than S. The H–Se bond is therefore weaker than the H–S bond and H_2Se is thus a stronger acid than H_2S. The order is therefore $H_2O < H_2S < H_2Se < H_2Te$.