1) In a typical perfluoroalkane, the bond between which two atoms is generally the weakest?

2-5) Circle the weakest sigma bond in each molecule:

6-8) C₄F₁₀ has a molecular weight over four times that of C₄H₁₀, yet their boiling points are less than 1°C different – why?

The increase in MW should increase the boiling point. However, the decrease in intermolecular interactions (because of the low pair of electrons on the fluorine) decreases the boiling point.

9) Perfluoroalkanes undergo usually only one type of reaction. Name it.

Reductive Defluorination.

10-12) State three facts about ozone depletion and the Montreal Protocol. (Do not show any chemical equations!)

Started in 1987; concerned with the reduction & phasing out of CFCs which destroy the ozone; mainly CFCs & Freons; ozone hole is above Antarctica; protocol is working;
13-16) Write the mechanism for the following reaction:

![Mechanism Diagram](image)

17-20) Draw in the 4 curly arrows for this mechanism.

![Mechanism Diagram](image)