Answer for Part I:

When the effective frequency is 48kHz, we could hear the signal pitch raising all the way from low frequency to 17000Hz. However, when we decrease the effective frequency, for example, to 4kHz, we started to hear multiple sound when the signal frequency reached to 2kHz (Half of 4kHz). We think this is because according to Nyquist theorem, aliasing happened, so we cannot hear the original frequency of the signal.