Question 1
Discuss the differences between a system of difference equations and a system of differential equations. Give an example of a biological system that would most appropriately be modeled using difference equations and explain why a differential equation representation would not be appropriate.
Question 2
Consider the time-dependent response shown in the figure below. Estimate the time constant for the response, and explain your reasoning.
Question 3
Consider the two functions $f(x)$ and $g(x)$ shown in the sketches below. Sketch the convolution of the two functions: $f(x) \otimes g(x)$. 

![Sketch of functions](image-url)
Question 4

In the context of the diagram below, explain the principle of common mode rejection. Indicate where such a design might be used in a biological system, and what desirable properties it might have.
Question 5
Explain the phenomenon of aliasing, and what implications it has for determining sampling rate in experimental designs.