1. (6 points) You are given a system with the impulse response \( h(t) = 2^{-2t}u(t) \).

   (a) What is the output of the system when the input is \( x(t) = \delta(t+1) \)?

   (b) Find the step response of the system.

   (c) Is this system BIBO stable?
2. (4 points) For each of the following systems, indicate if the system is linear/nonlinear, causal/noncausal, and time varying/time invariant. Briefly, explain your reasoning.

(a) $\ddot{y}(t) + 2ty(t) = x(t)$

(b) (For extra credit: 4 points) $y(t) = \int_{0}^{2} x(t - \tau^2) d\tau$