

R 4.107 Determine whether the LTI system with each impulse response h given below is causal and/or memoryless.

(a) $h(t) = u(t+1) - u(t-1)$;

(b) $h(t) = e^{-5t}u(t-1)$;

(c) $h(t) = (t^2 - 1)\sin(t)\delta(t+1)$;

(d) $h(t) = \pi\delta(t+42)$;

(e) $h(t) = (t^2 + 4)[u(t+5) - u(t+3)]$; and

(f) $h(t) = \cos(t)\delta(t + \frac{\pi}{2}) + 5\delta(t)$.

Short Answer. (a) has memory, not causal; (b) has memory, causal; (c) memoryless, causal; (d) has memory, not causal; (e) has memory, not causal; (f) memoryless, causal