



Problem Set 5

Classwork :-

1. Using the convolution property, find the F.T of the following functions :-

a) $g(t) = [\text{rect}(\frac{t-1}{2}) - \text{rect}(\frac{t+1}{2})] \otimes \text{rect}(\frac{t}{2})$

b) $g(t) = u(t) \otimes u(t)$

c) $g(t) = [e^{-t} \cdot u(t)] \otimes u(t)$

d) $g(t) = 2 \cdot \text{rect}(t) \otimes \delta(t - 2)$

e) $g(t) = [e^{-t} \cdot u(t)] \otimes [e^{-2t} \cdot u(t)]$

f) $g(t) = u(t) \otimes \text{rect}(t)$

2. Using the convolution property, find the I.F.T of the following functions :-

a) $G(f) = 2 \cdot \text{sinc}(2f) \otimes [\delta(f - 2) + \delta(f - 2)]$

b) $G(f) = \frac{1}{(2+2\pi f j) \cdot (5+2\pi f j)}$

3. An LTI system has an impulse response $h(t) = \text{rect}(\frac{t-1}{2})$, is excited by an input $x(t) = h(t)$:-

a) Find the system transfer function $H(f)$.

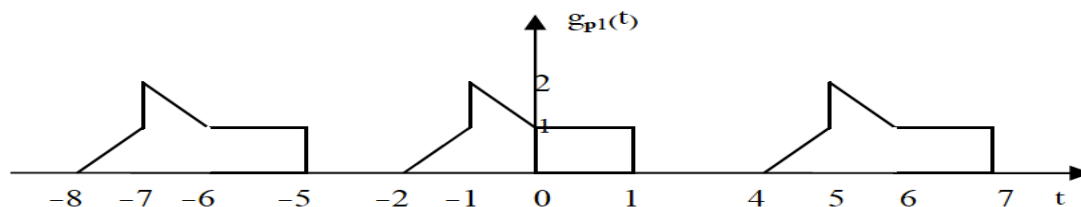
b) Find and sketch the system output $y(t)$.

c) Is the system causal or not ? Why?

d) Find and sketch the system output $y(t)$; if $x(t) = 2 \cdot \text{rect}(\frac{t-2}{4})$.

4. For the given periodic signals, find and sketch the F.T :-

a)



b)

