

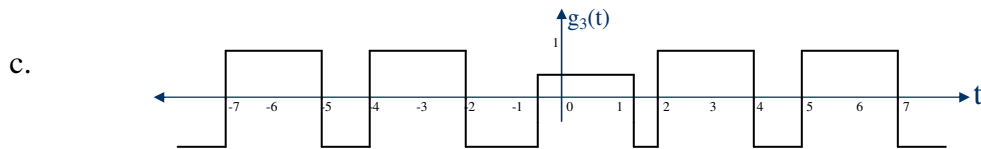
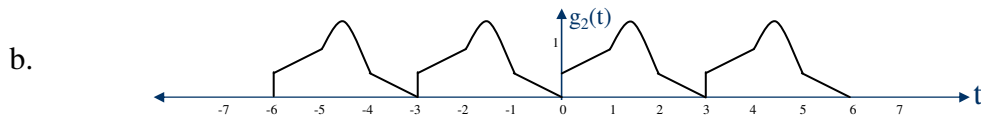
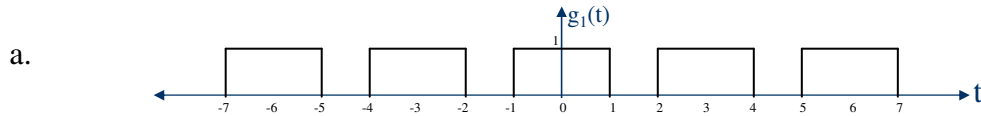


COLLEGE OF ENGINEERING & TECHNOLOGY

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Course : Spectral Analysis
Course Code : EC321

Sheet 0

1. Determine whether of the following signals are periodic or not. If the signal is periodic, determine its fundamental period.



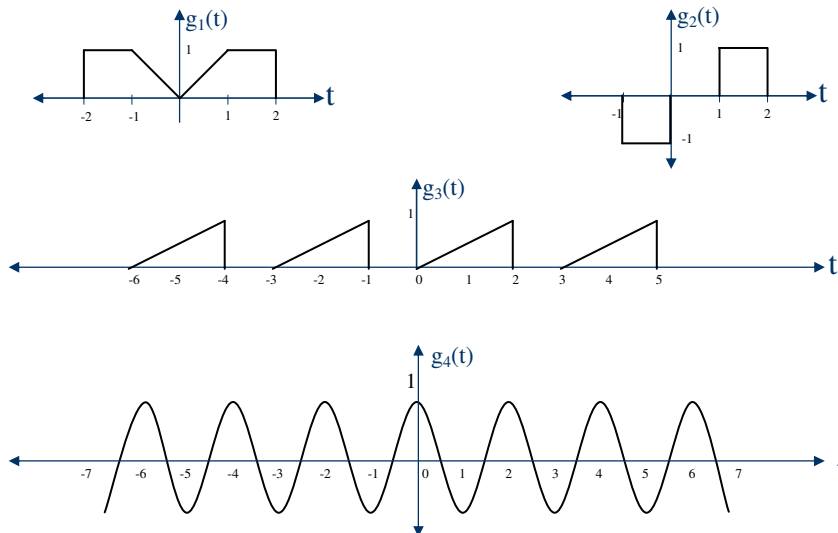
d. $g(t) = \cos\left(\frac{\pi}{4}t + \frac{\pi}{3}\right) + \sin\left(\frac{\pi}{4}t + \frac{\pi}{3}\right)$

e. $g(t) = \sin^2 t$, $\sin^2 x = \frac{1}{2}(1 - \cos 2x)$

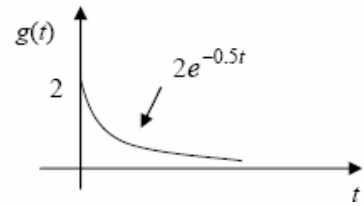
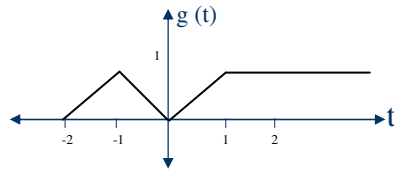
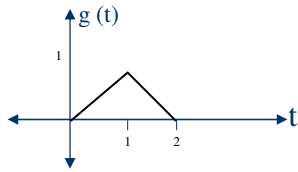
f. $g(t) = e^{j(\pi t - 1)}$

g. $g(t) = \begin{cases} \cos(t) & \text{if } t < 0 \\ \sin(t) & \text{if } t \geq 0 \end{cases}$

2. Determine whether of the following signals are energy signals, power signals, or neither.



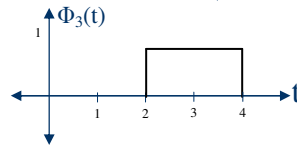
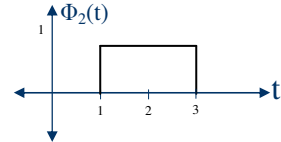
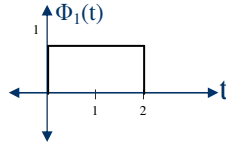
3. Sketch and label the even and odd components of the signals shown below



4. Sketch the following signals.

a. $g_1(t) = \phi_1(t) + \phi_2(t) + \phi_3(t)$

b. $g_1(t) = \phi_1(t) + 2\phi_2(t) - 3\phi_3(t)$



5. Represent the following signals in terms of $\Phi_1(t)$, $\Phi_2(t)$ and $\Phi_3(t)$, shown in Problem 4

