



Birzeit University – Faculty of Engineering
Electrical and Computer Engineering Systems
Signal and Systems – ENEE334

Instructor: Mr. Ayman Rabee

1. Book Problems:

4.8, 4.16, 4.22, 4.26, 4.32

Bonus: 4.30

2. External Problems:

a. Find the Fourier Transform of $x(t) = \frac{t^{n-1}}{(n-1)!} e^{-at} u(t)$

b. Consider a LTI system given by:

$$h(t) = \frac{\sin(4\pi(t-1))}{\pi(t-1)}$$

Determine the output $y(t)$ for each of the following inputs:

1. $x_1(t) = \cos(6\pi t + \pi/2)$

2. $x_2(t) = \frac{\sin(4\pi(t+1))}{\pi(t+1)}$

3. $x_3(t) = \left(\frac{\sin(2\pi t)}{\pi t}\right)^2$

c. Suppose that $g(t) = x(t) \cos(\pi t)$ and the Fourier Transform of $g(t)$ is $G(f)$ given by

$$G(f) = \begin{cases} 1, & |f| \leq 2 \\ 0, & \text{otherwise} \end{cases}$$

1. Find $x(t)$

2. Specify the Fourier Transform $X_1(f)$ of $x_1(t)$ such that

$$g(t) = x_1(t) \cos\left(\frac{2}{3}\pi t\right)$$