GATE ASSIGNMENT 1

Amulya Tallamraju
AI20BTECH11003

Download all python codes from

https://github.com/AmulyaTallamraju/EE3900/blob/main/GATE_Assignment−2/codes/GATE_Assignment−2.py

and latex-tikz codes from

https://github.com/AmulyaTallamraju/EE3900/blob/main/GATE_Assignment−2/GATE_Assignment−2.tex

1 GATE EC 2005 Q.5

The function $x(t)$ is shown in figure. Even and odd parts of a unit step function u(t) are given by

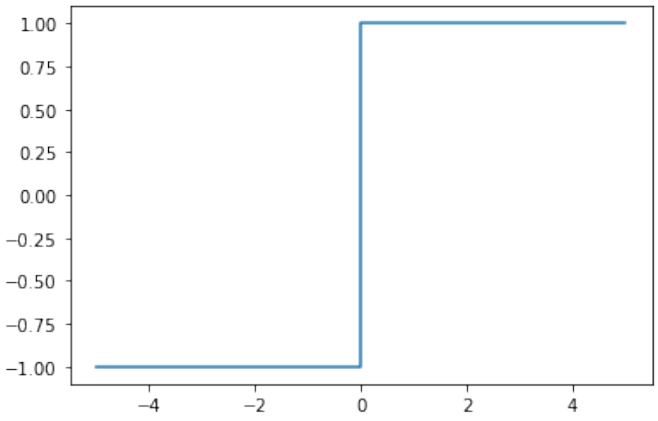

Fig. 0: Plot of $x[t]$

2 Solution

Odd part of $u(t)$ is given by

$$\frac{u(t)-u(-t)}{2} \tag{2.0.1}$$

One observing the plots of $x(t), u(t), -u(-t)$ we can see that

$$x(t) = u(t) - u(-t) \tag{2.0.2}$$

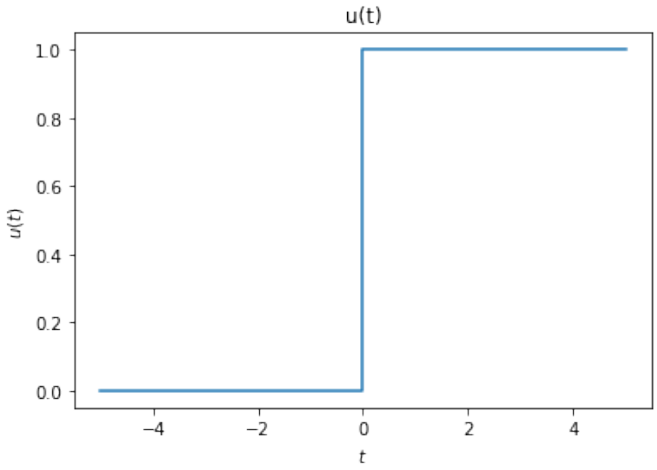

Fig. 0: Plot of $u[t]$

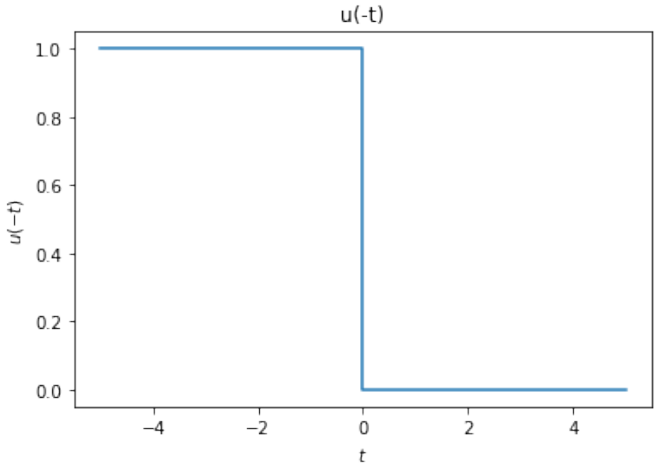

Fig. 0: Plot of $u[t]$

Thus, the odd part of $u(t)$ is $\frac{x(t)}{2}$. The even part of u(t) is given by

$$\frac{u(t)+u(-t)}{2} = \frac{1}{2} \tag{2.0.3}$$

Thus the even and odd parts of the unit step signal are

$$\frac{1}{2}, \frac{x(t)}{2} \tag{2.0.4}$$

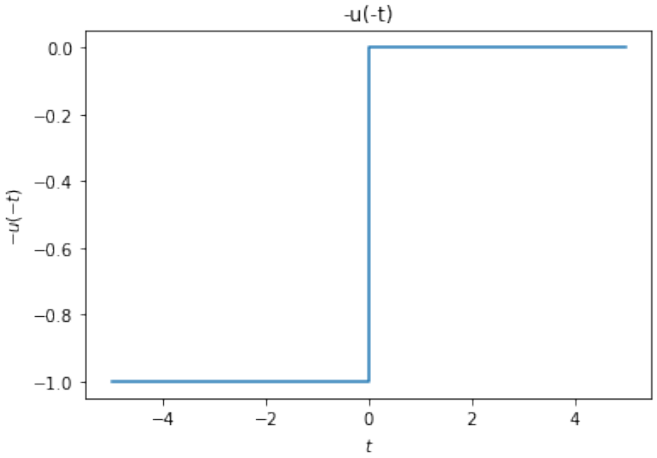

Fig. 0: Plot of $-u[-t]$