RAMAIAH UNIVERSITY OF APPLIED SCIENCES

Faculty of Engineering Technology

Department	**: Mathematics and Statistics**
Programme	**: B. Tech. (All Branches)**
Semester / Batch	**: 2 / 2023**
Course Code	**: MTF111A**
Course Title	**: Engineering Mathematics - 2**

Tutorial – 11: Fourier Transforms

Sl No	Questions	
1	Determine the Fourier transform of the given functions.	
	Function	**Fourier transform**
	a. $f(t) = \begin{cases} 1 - t^2, \text{for } \lvert t\rvert \le 1 \\ 0, \quad \text{for } \lvert t\rvert > 1 \end{cases}$	$\mathcal{F}(\omega) = \dfrac{4(\sin\omega - \omega\cos\omega)}{\omega^3}$
	b. $f(t) = \begin{cases} 1 - \lvert t\rvert, \text{for } \lvert t\rvert \le 1 \\ 0, \quad \text{for } \lvert t\rvert > 1 \end{cases}$	$\mathcal{F}(\omega) = \dfrac{2(1-\cos\omega)}{\omega^2}$
	c. $f(t) = \begin{cases} 2, \text{for } \lvert t\rvert \le 1 \\ 0, \text{for } \lvert t\rvert > 1 \end{cases}$	$\mathcal{F}(\omega) = \dfrac{4}{\omega}\sin\omega$
	d. $f(t) = te^{-\lvert t\rvert}$	$\mathcal{F}(\omega) = -\dfrac{4i\omega}{(1+\omega^2)^2}$
	e. $f(t) = e^{-a\lvert t\rvert}$	$\mathcal{F}(\omega) = \dfrac{2a}{a^2+\omega^2}$