MAU22E01 2020 (SF Engineers & MSISS & MEMS)

S h e e t 10

Practice sheet - will not be marked

It is important to be able to do all the problems, including unmarked ones, to ensure you are prepared for the exam.

Exercise 1

Sketch graphs of the following functions and determine ones that are 2π-periodic:

(i) $\sin|x|$;

(ii) $\cos 2|x|$;

(iii) $|\sin 3x| + \sin 3|x|$.

Exercise 2

Find the Fourier series of the function:

(i)

$$f(x) = \begin{cases} 0 & \text{if } -\pi < x < 0 \\ 1 & \text{if } \quad 0 < x < \pi \end{cases};$$

(ii)

$$f(x) = \begin{cases} x \text{ if } |x| < \pi/2 \\ 0 \text{ if } \pi/2 < |x| < \pi. \end{cases}$$