Marmara University, Computer Engineering Department

Introduction to Signals and Systems
Online Midterm Exam
8.06.2020

Solution and Submission Rules

- Textbook, slides and notes are open.
- Internet usage is not allowed; however, computers and cell phones may be used only viewing course materials provided for this course.
- This online exam consists of 3 questions.
- Please write your answers clearly and neatly.
- Show all your work.

Exam Checklist

- ☐ I have written my name, surname and student ID on the top of each exam solution page.
- ☐ I have written the following sentence on the top of the first page with my handwriting and signed it:

  "*On my honor, I have neither given nor received any unauthorized assistance on this examination*."
- ☐ I have solved all the questions with my handwriting on blank A4 pages.
- ☐ I have scanned all the solution pages to a single PDF file named "myname_surname.pdf".
- ☐ I have uploaded the PDF file via UES system before the deadline.

1) Convolve $\chi_{(2,5)}(t) + 2\chi_{(5,6)}(t)$ with $\chi_{(0,3)}(t)$. Plot your result.

2) Filter the signal

1 3 3 1
$\underline{0}$ 0 2 3
0 1 0 1
1 5 3 0

with the filter

1 0 0
0 $\underline{1}$ 1
1 0 0

Use periodic boundary conditions.

3) a) Plot the signal $f(t)$

$$f(t) = \sum_{k=-2}^{2} (t - 2k + 1)\chi_{(0,1)}(t - 2k) \tag{1}$$

b) Plot $\frac{df(t)}{dt}$