IIIT-H
Networks, Signals, and Systems
Monsoon-2024

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Assignment 2

Submission Date & Time: 18-September-2024, 8PM (Hard Deadline : 22nd September, 8PM)
Instructions:

- **You are free to discuss the problems with co-students, TAs, and instructor if needed. However, you should write down all answers yourself.**
- All steps should be justified in detail.
- **Any attempt at plagiarism will result in ZERO for the assignment, apart from other academic consequences.**
- TAs will likely (but not guaranteed) also upload the solutions (some solutions may not be elaborate but gives essential ideas) after the submission. This will be treated as the master document for evaluation.
- **Evaluation done by TAs/Instructor will generally be final. Appeals on the evaluation will generally not be permitted for assignments, unless the solution is wrong for some question.**

Remark: Do not mind general remarks made in brackets. They are only to convey what the problem itself is about.

Remark: Few problems here are mentioned as "submit as part of assignment 3". They need not be submitted by the deadline. Nevertheless they are important from the Midsem point of view.

1. **Fourier Series :** (From Chapter 3).
   - 3.22 a [do this q only for figures b,d,e], 3.22 (b), 3.22 (c).
   - 3.25 (product of signals)
   - 3.26 (properties of FS)
   - 3.34 (Response of LTI systems to inputs)
   - 3.41 (given some facts that use FS properties, determine the signal).
   - 3.45 (question involving real FS, even odd signals).
2. **Laplace Transform:** (From Chapter 9)
   - 9.21 (Straightforward calculation of Laplace transforms of various signals)
   - 9.26 (properties of LT)
   - 9.29 (output of LTI via Laplace)

- 9.33 (causal LTI system and Laplace) [Submit as part of Assignment 3]

3. (This portion is important for Mid sem but can be submitted as part of assignment 3 submission):
   LTI systems: Do problems as follows from Chap 2.

   - 2.22 (this problem deals with responses to various inputs with various impulse responses),
   - 2.23 (again responses of LTI systems to impulse train),
   - 2.29 (causality and stability of LTI systems)
   - 2.40 (this problem deals with finding impulse response and output),
   - 2.48 (determine various outputs if they can be determined),