

Indian Institute of Science

Mathematical Methods and Techniques in Signal Processing

Instructor: Shayan Srinivasa Garani

Home Work #2, Spring 2024

Late submission policy: Points scored = Correct points scored $\times e^{-d}$, $d = \#$ days late

Assigned date: Feb. 15th, 2024

Due date: Mar. 1st, 2024, 11:59 pm.

PROBLEM 1: It is desired to convert a signal at 44.1 KHz from a compact disc (CD) to a 48 KHz signal compatible for a digital audio tape (DAT). Provide all the details of the implementation using a fractional delay filter. The suggested reading material is the published research paper by K. Rajamani, Y-S. Lai and C. W. Farrow, "An Efficient Algorithm for Sample Rate Conversion from CD to DAT," IEEE Signal Proc. Letters, vol. 7, no. 10, Oct. 2000. (50 pts.)

PROBLEM 2: Solve problems 4.24, 5.22 and 5.23 from P. P. Vaidyanathan's book. (50 pts.)