

DIGITAL SIGNAL PROCESSING

CHAPTER 1: Introduction to Discrete-time Signal and Sampling

QUIZ 1 (10 Marks)

Name: _____

Date: _____

The input continuous-time signal to the Discrete-time System (DTS) is described below;

$$x_a(t) = 5 \sin(40\pi t) - 3 \cos(60\pi t) + 3 \sin(180\pi t)$$

The signal then is sampled at every 2 ms, generating a sequence of $x[n]$ for $0 \leq n \leq 5$, by a sampling process shown in Figure 1.

- (i) Determine the new sampling rate, F_s' .
- (ii) Determine the expression of $x[n]$ after sampling
- (iii) Determine the final sequence, $x'[n]$ if the signal then, up-sampled by a factor 2, and then, down-sampled by a factor of 4.

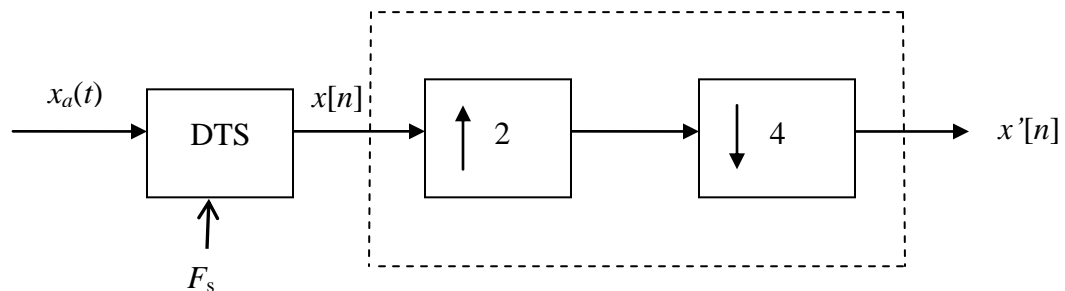


Figure 1