



Department of Computer Systems Engineering  
University of Engineering & Technology  
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Subject: Digital Signal Processing (5<sup>th</sup> Semester)

Exam: Mid Term (Fall 2020)

Total Marks: 20

Attempt All Questions. Time allowed : by parts

**Question 1:** (CLO\_1)

- 1) State and explain the three main difference between the continuous-time and discrete time sinusoidal signals, **based on frequency**. (3 Marks)
- 2) Let the signal  $x(t)$  given below is sampled with a sampling frequency of  $F_s = U \cdot 100$  Hz.
  - i. Does the sampling frequency satisfy the Nyquist criteria? (1 Marks)
  - ii. Find the resultant discrete signal  $x[n]$ . (1 Marks)
  - iii. Is the discrete signal periodic or aperiodic? (1 Marks)

$$x(t) = 3 \sin(T \cdot 100\pi t + \theta) + 2 \sin(T \cdot 50\pi t + \theta)$$

**U = Digit at unit place of your registration number if it is less than or equal to 4. If it is greater than 4 or is Zero then use U=4.**

**T = Digit at tens place of your registration number if it is less than or equal to 4. If it is greater than 4 or is Zero then use U=4.**

- 3) For the  $x(n)$  shown in Figure 1, find and sketch
  - a.  $-x(\frac{1}{2}n + 2)$
  - b.  $2x(-2n + 3)$

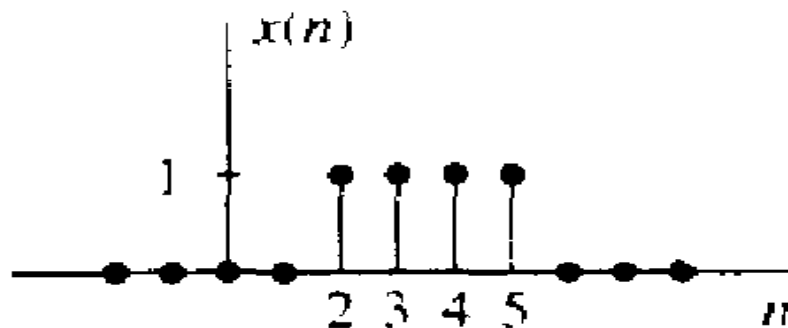


Figure 1