AL-MUSTAQBAL UNIVERSITY COLLEGE

Department of Biomedical Engineering

Faculty of Engineering

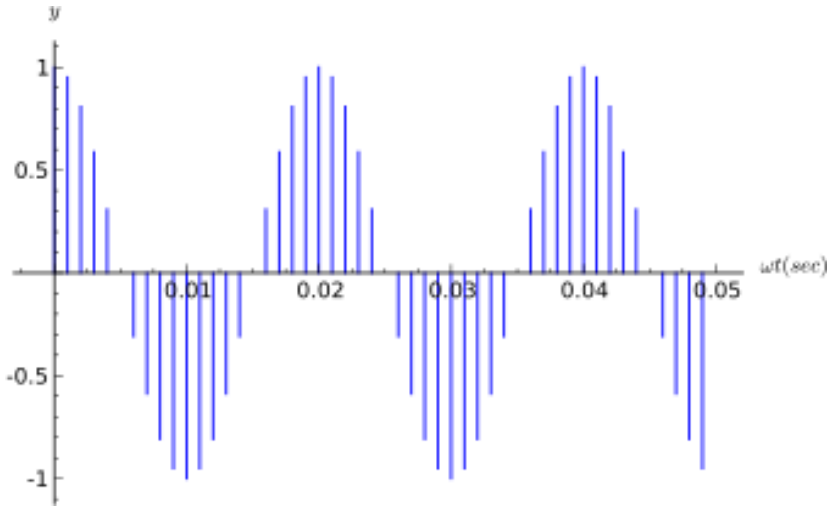
Dr. Zaidoon AL-Shammari

BME 322
Signals and Systems for BME

- 4 -
Sequences

Babylon – Iraq – May 2021

Sequences



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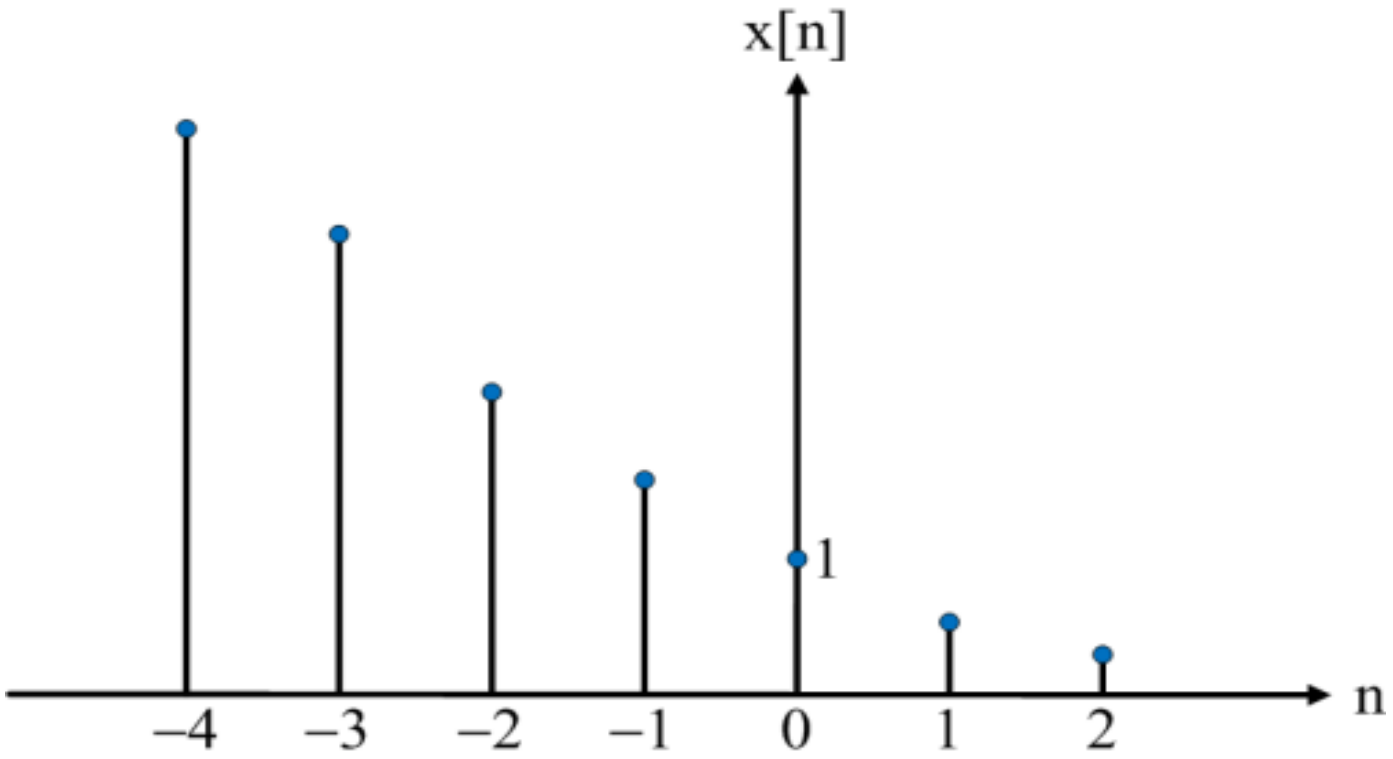
Real Exponential Sequence

$x[n] = a^n$

$0 < a < 1$



Real Exponential Sequence

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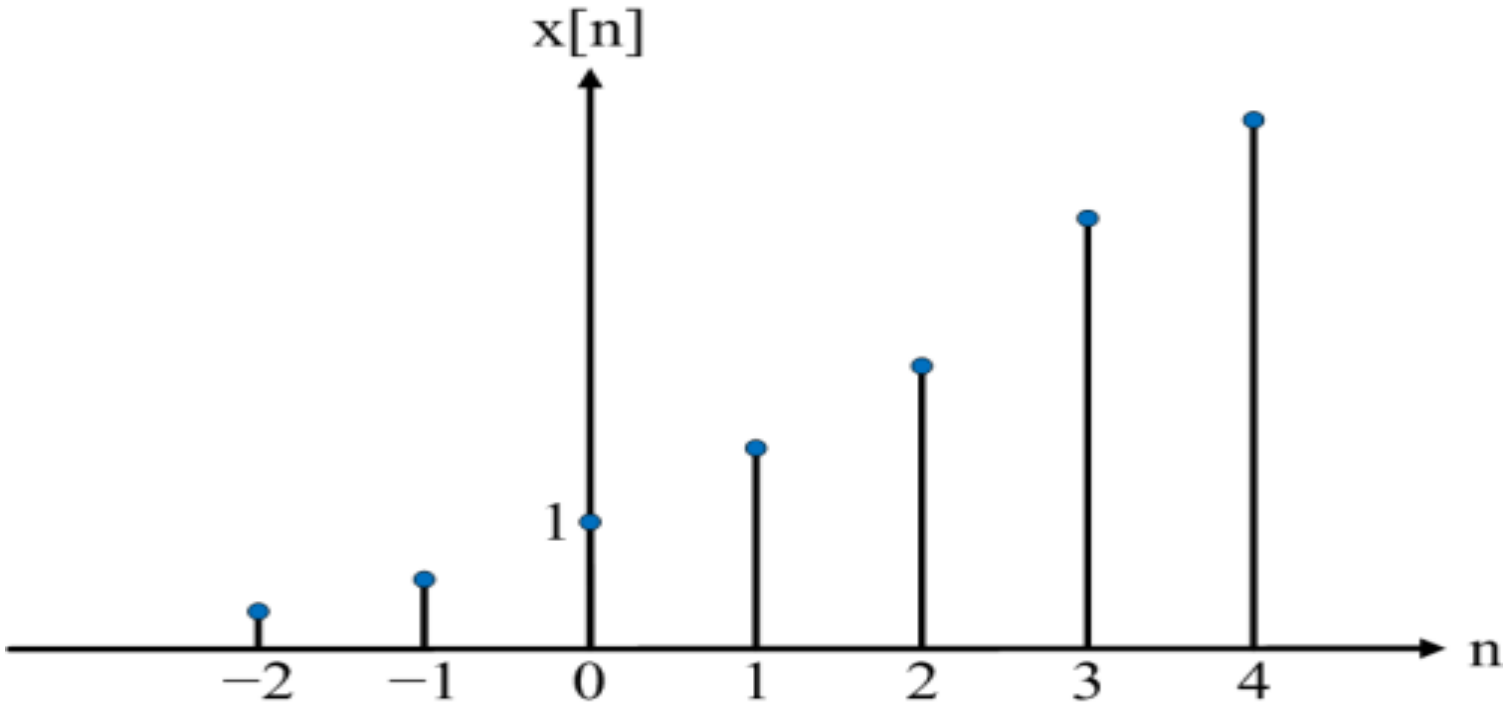


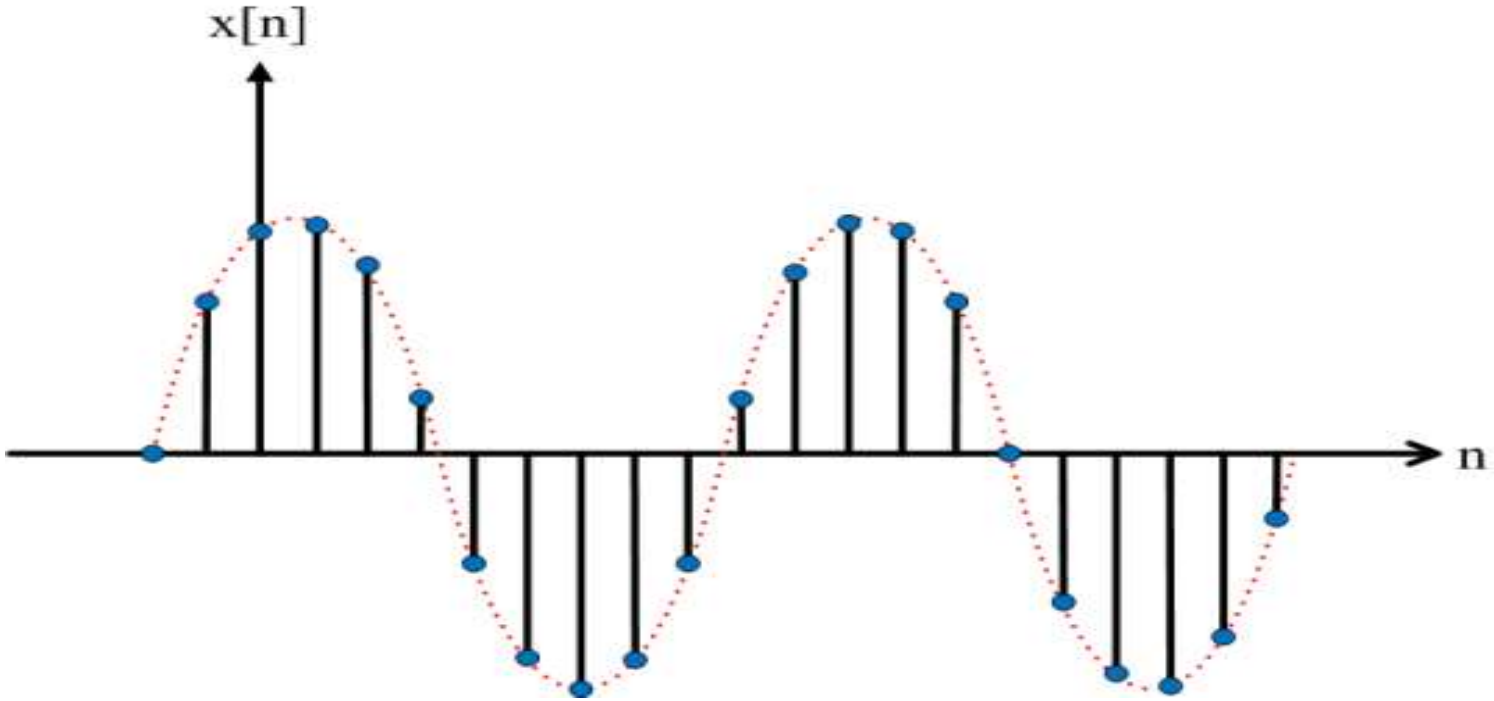
Example 1

Draw the signal $x[n] = e^{-0.5n}$

n	x(n)
–2	2.7183
–1	1.6487
0	1.0000
1	0.6065
2	0.3679
3	0.2231
4	0.1353

Sinusoidal Sequence

$$x[n] = A\cos(n\omega_0 + \varphi)$$



Example 2

Draw the signal x[n] = cos(2n)

n	x(n)
0	1.0000
1	-0.4161
2	-0.6536
3	0.9602
4	-0.1455
5	-0.8391
6	0.8439
7	0.1367

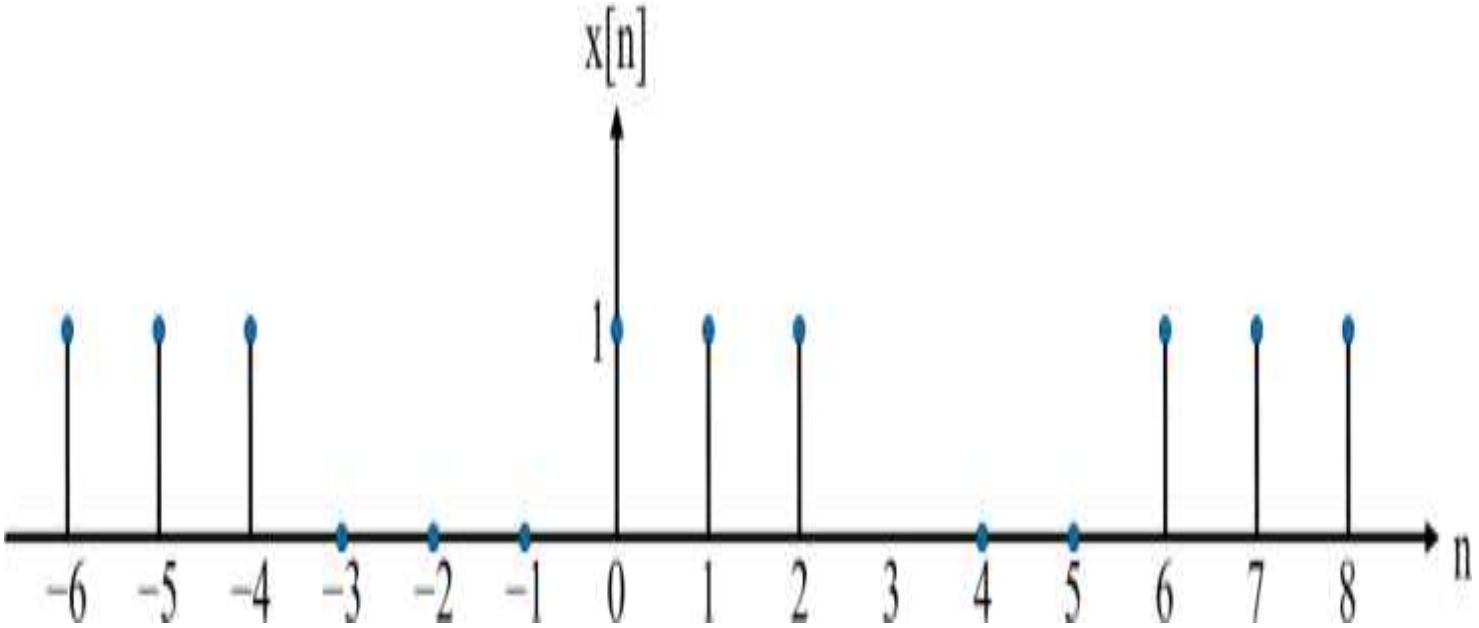
Periodic Signal

- A sequence x(n) is defined to be periodic with period N if

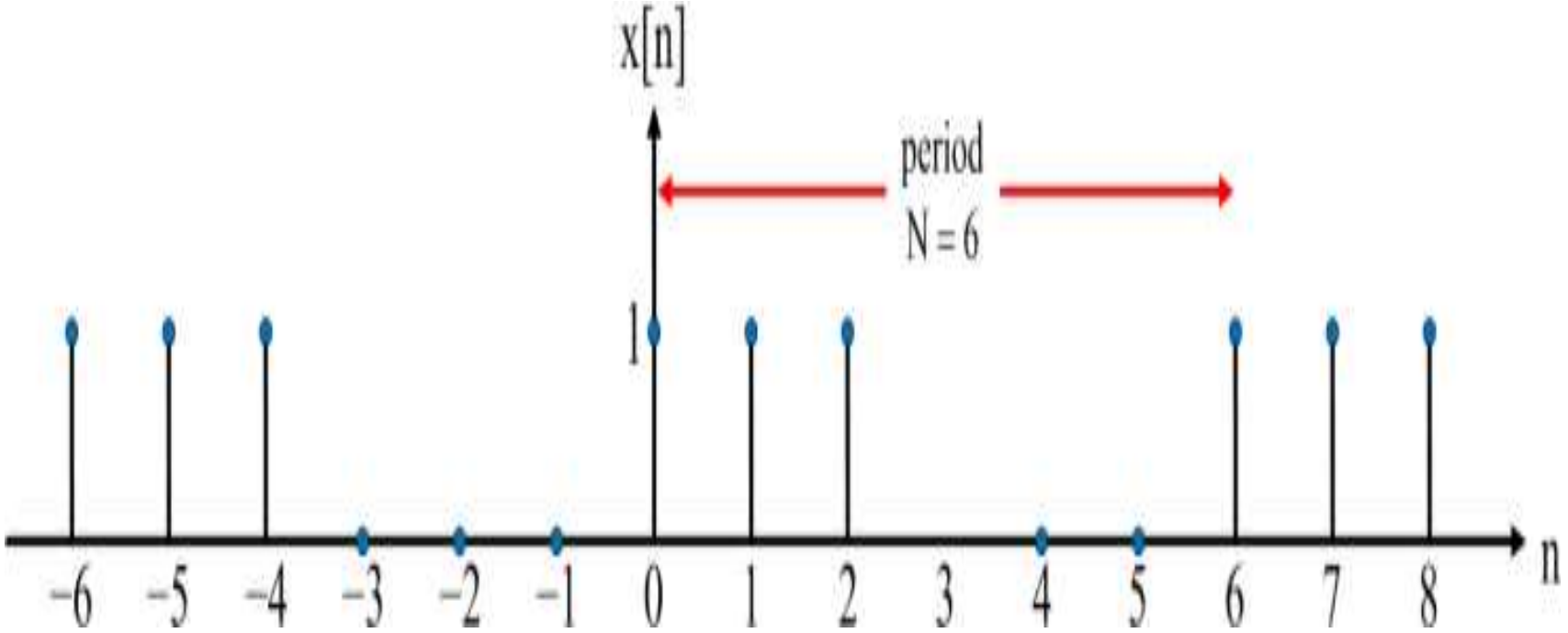
$$x[n] = x[n + N] \quad \text{for all } N$$

Example 3

Is the discrete signal x[n] a periodic signal?



Example 3



The values of x[n] repeat themselves after 6 samples.