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| **Credit Hours System- ELCN306** |

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| **Cairo University**  **Faculty of Engineering** |

**Communications 1**

**Final Assessment**

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# Test Case 1

Givens:

* m(t) = 5 cos (2πfmt)
* fm = 10
* fs = 40
* μ = 0
* L = 8
* mp = 5
* Unipolar NRZ

Results:

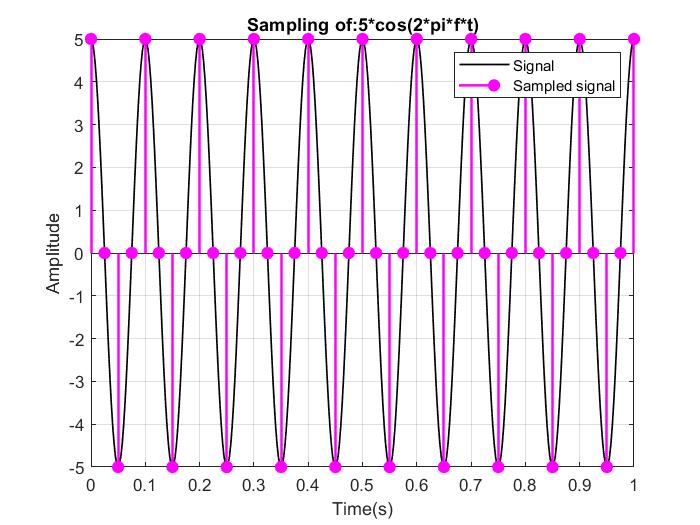


Figure \_Test\_Case\_1\_Sampler

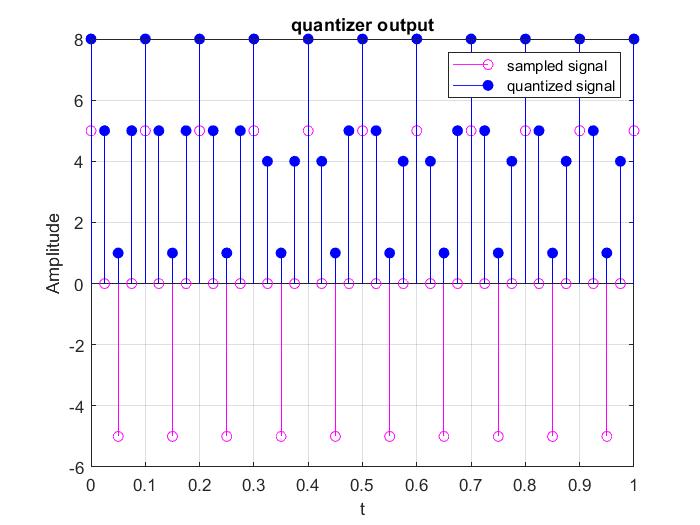


Figure \_Test\_Case\_1\_Quantizer

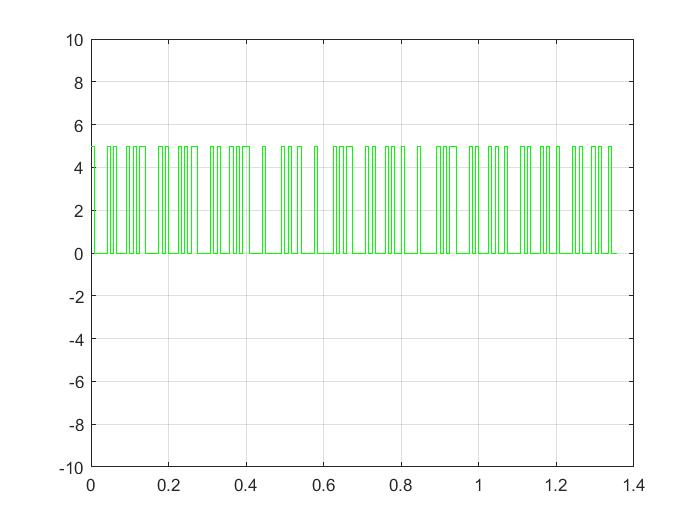


Figure \_Test\_Case\_1\_Encoder\_UniPolar

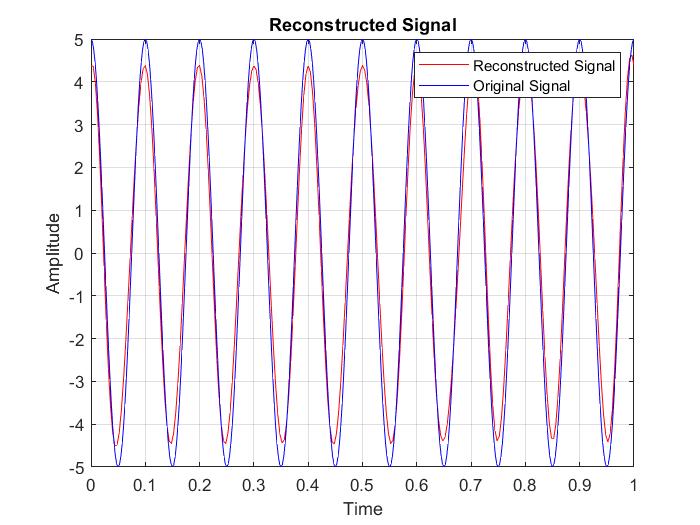


Figure \_Test\_Case\_1\_Resconstructed

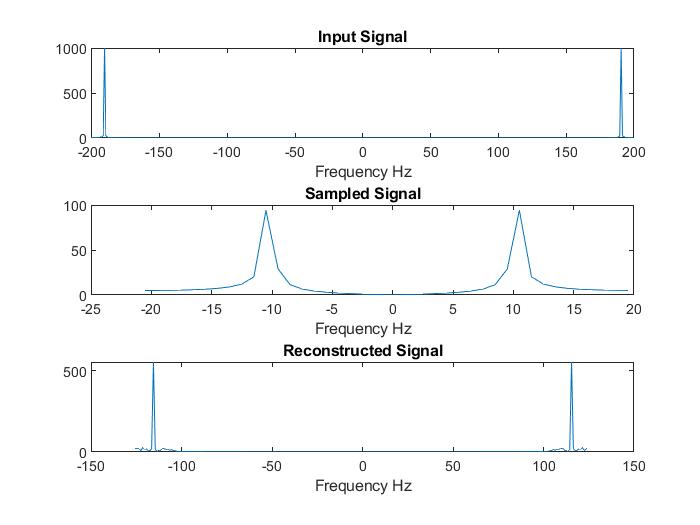


Figure \_Test\_Case\_1\_Combined

Comments:

* When fs=40 the signal can be reconstructed since fs 2BW.
* There is a difference between the sampled message and the quantized message due to the quantization error and can be decreased by increasing number of quantization levels.

# Test Case 2

Givens:

* m(t) = 5 cos (2πfmt)
* fm = 10
* fs = 20
* μ = 0
* L = 32
* mp = 5
* Polar NRZ

Results:

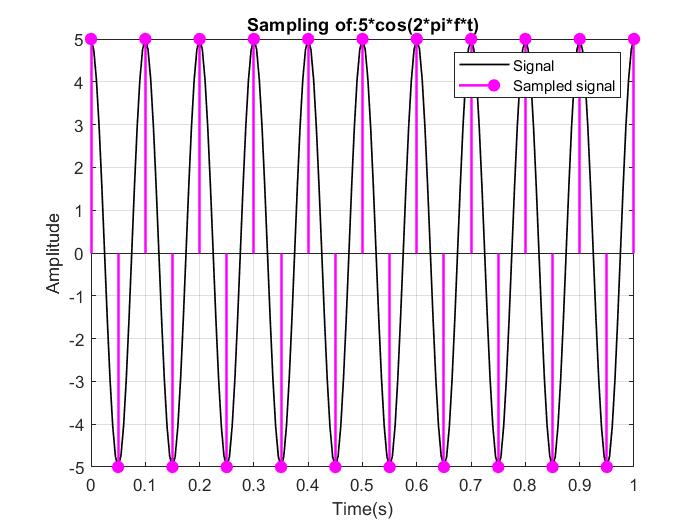


Figure \_Test\_Case\_2\_Sampler

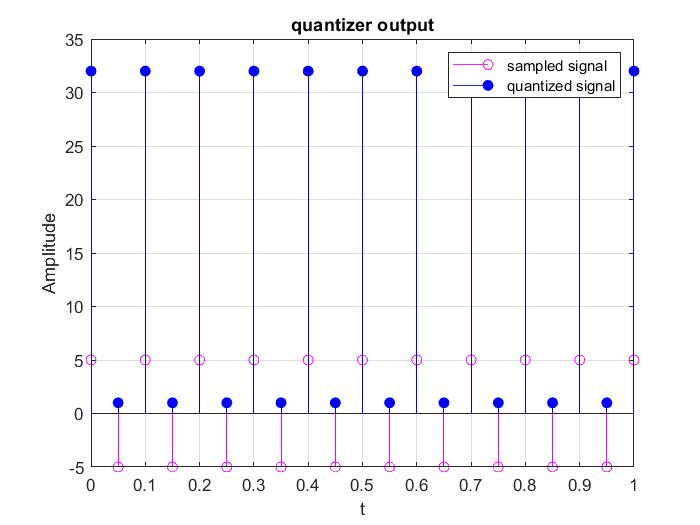


Figure \_Test\_Case\_2\_Quantizer

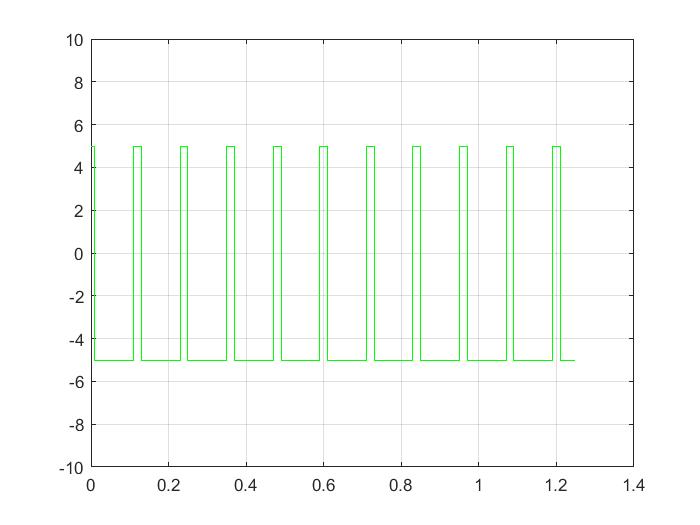


Figure \_Test\_Case\_2\_Encoder\_Polar

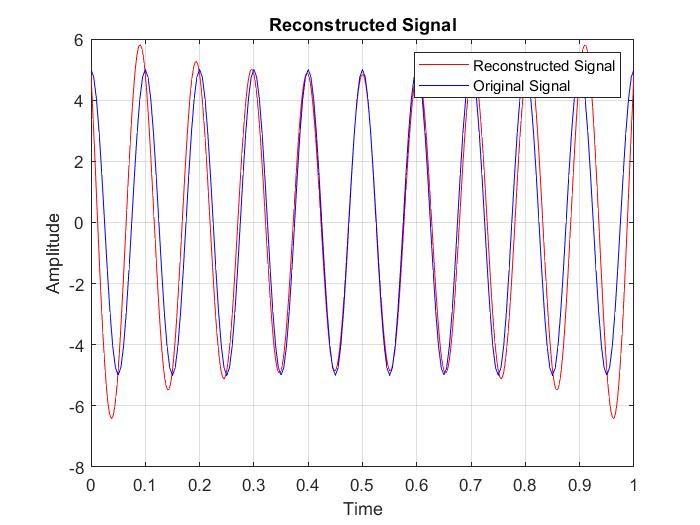


Figure \_Test\_Case\_2\_Resconstructed

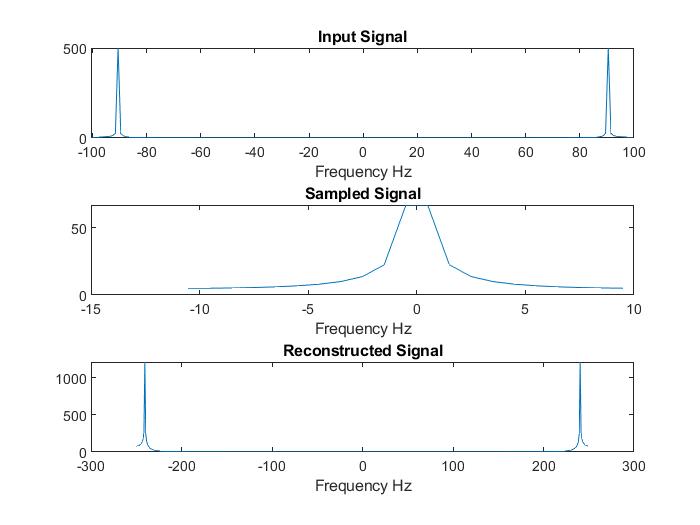


Figure \_Test\_Case\_2\_Combined

Comments:

* When fs = 20 the signal can be reconstructed since fs 2BW.
* The sampled message and the quantized message are almost the same as the quantization level is high as L=32.

# Test Case 2

Givens:

* m(t) = 5 cos (2πfmt)
* fm = 10
* fs = 20
* μ = 0
* L = 32
* mp = 5
* Polar NRZ

Results:

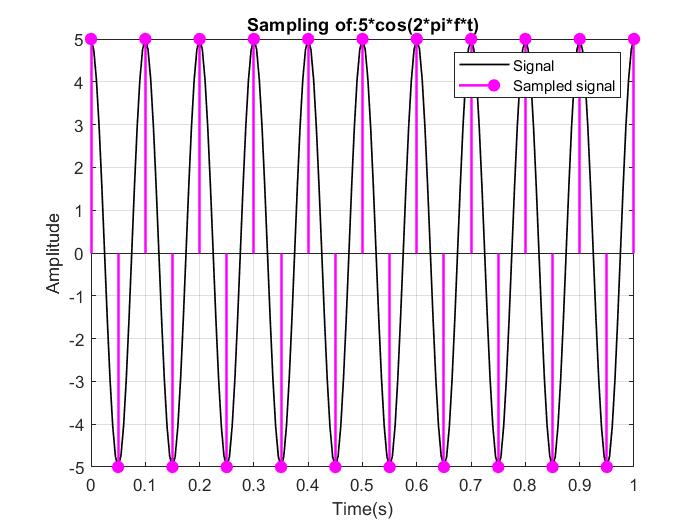


Figure 6\_Test\_Case\_2\_Sampler

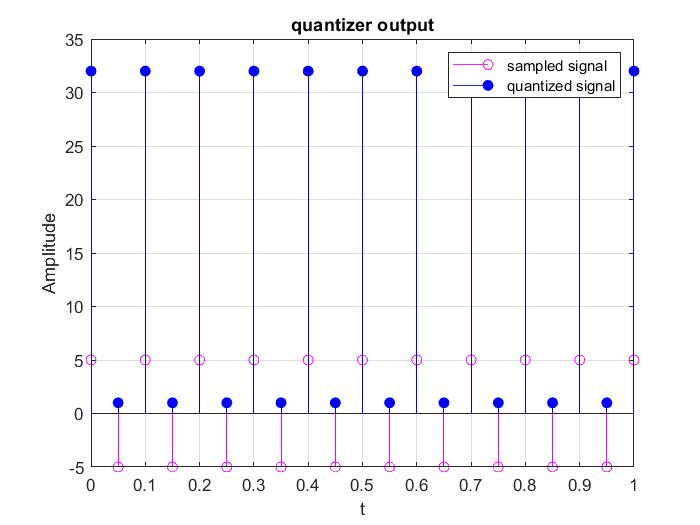


Figure 7\_Test\_Case\_2\_Quantizer

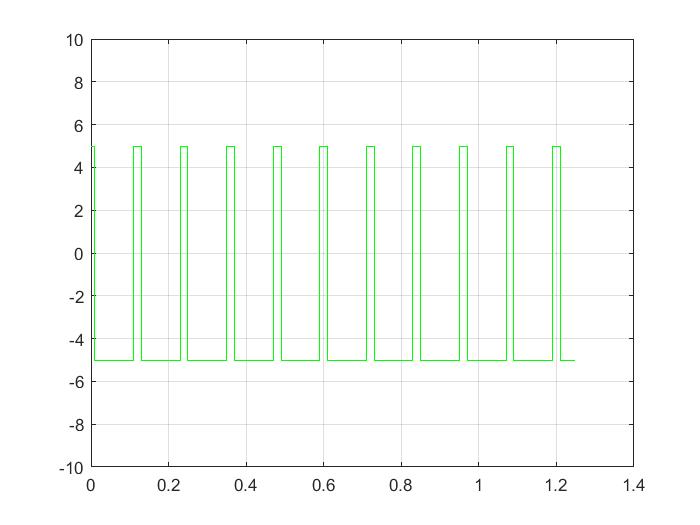


Figure 8\_Test\_Case\_2\_Encoder\_Polar

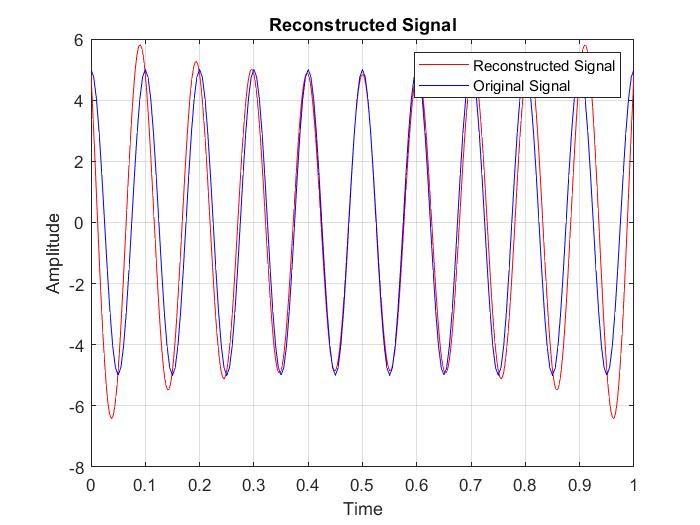


Figure 9\_Test\_Case\_2\_Resconstructed

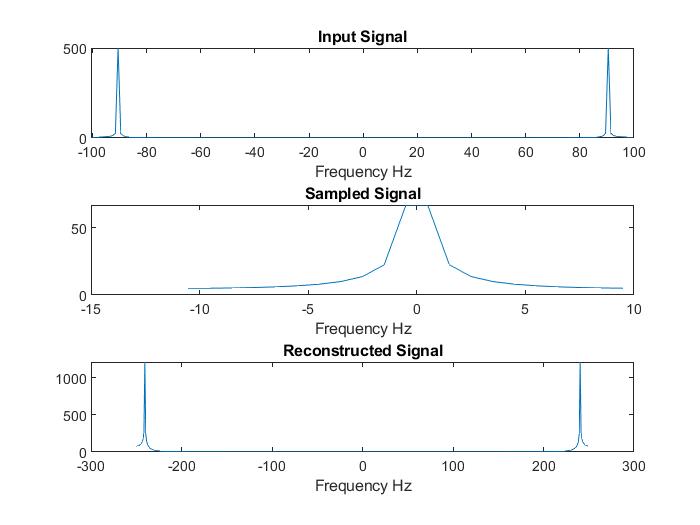


Figure 10\_Test\_Case\_2\_Combined

Comments:

* When fs = 20 the signal can be reconstructed since fs 2BW.
* The sampled message and the quantized message are almost the same as the quantization level is high as L=32.