

List of Topics Covered in Final Exam – Digital Signal Processing

1. Basics of discrete linear systems: linearity, time invariance, causality, stability, recursive form.
2. Periodicity of discrete signals and calculation of fundamental period.
3. Basics of signal shifting and scaling.
4. Basics of sampling theorem and analog signal reconstruction from samples.
5. Z-transform: forward and inverse and related theorems.
6. Discrete Time Fourier transform (DTFT) and Discrete Fourier transform (DFT) and their differences and properties.
7. How to increase frequency resolution using zero-padding.
8. Linear vs. circular convolution computation.
9. Discrete-time filter design specifications and their different forms.
10. Discrete-time IIR filter design from analog filter using bilinear transformation.
11. Discrete-time FIR filter design using window design method.
12. Discrete-time filter realizations: from equation to realization and back.