Вопросы к экзамену по учебной дисциплине

Теория электрических сигналов (осенний семестр)

для студентов, обучающихся на английском языке

1. Signals Classification
2. Transformations of the independent variable. Signal energy and power.
3. Elementary signals. (Complex exponential, sinusoidal, unit impulse)
4. Fourier series. Linear Combinations of Harmonically Related Complex Exponentials. Alternative forms of Fourier series representation.
5. Fourier series. Determination of the Fourier series representation of a continuous-time periodic signal. Synthesis and analysis equations
6. Convergence of the Fourier series. The Dirichlet conditions
7. Properties of the continuous-time Fourier series.
8. Representation of aperiodic signals: continuous-time Fourier transform.
9. Convergence of the Fourier transform. The Dirichlet conditions. The magnitude-phase representation of the Fourier transform.
10. Fourier transform for periodic signals
11. Basic properties of the Fourier transform
12. Systems. Introduction to convolution. Convolution property of the Fourier transform
13. Filtering
14. Cross-correlation function. Definition, properties, computation
15. Autocorrelation function. Definition, properties, computation
16. Sampling with ideal impulse train.
17. Spectrum of the ideal impulse sampled signal. Sampling theorem.
18. Undersampling and the problem of aliasing.
19. Sampling. Reconstruction of the analog signal in frequency and time domain
20. Random processes. Stationary random processes.
21. Ensemble averages. Properties of ensemble averages. Power spectral density. Properties.
22. White Gaussian noise. Distribution. Power spectral density and autocorrelation function of WGN.
23. Narrowband noise. Representations, properties. PDF.