Sinyal dan Sistem - ACP 2 - 17 Nov

Kode Soal: B

Nama _____

NIM: _____

[3.3.1] What is the fundamental frequency ω_0 of a periodic signal if its fundamental period is T?
A. $\omega_0 = T/2\pi$
B. $\omega_0 = 2\pi/T$
C. $\omega_0 = \pi T$
D. $\omega_0 = 1/T$

[3.3.7] What is the name given to the equation $x(t) = \sum_{k=-\infty}^{+\infty} a_k e^{jk\omega_0 t}$, which reconstructs a signal from its Fourier series coefficients?
A. Analysis equation
B. Synthesis equation
C. Convolution equation
D. Transform equation

[3.6.1] What is a key difference between the Fourier series representation of discrete-time periodic signals and continuous-time periodic signals?
A. Discrete-time is an infinite series, continuous-time is a finite series.
B. Discrete-time is a finite series, continuous-time is an infinite series.
C. Both are always infinite series.
D. Both are always finite series.

[3.6.4] What is the primary purpose of the discrete-time Fourier series analysis equation $a_k = \frac{1}{N}\sum_{n=\langle N\rangle} x[n]e^{-jk(2\pi/N)n}$?
A. To reconstruct the signal $x[n]$ from its coefficients.
B. To determine the Fourier series coefficients a_k from the signal $x[n]$.
C. To calculate the total energy of the signal.
D. To find the fundamental period N.

[3.7.1] What is a common similarity between the properties of discrete-time Fourier series and continuous-time Fourier series?
A. They are identical in all aspects.
B. The multiplication of two signals in the time domain corresponds to a form of convolution in the frequency domain.
C. Both always result in an infinite number of coefficients.
D. There are no similarities.

[3.3.4] In the Fourier series representation $x(t) = \sum_{k=-\infty}^{+\infty} a_k e^{jk\omega_0 t}$, what are the terms for $k = +1$ and $k = -1$ collectively referred to as?
A. DC component
B. Second harmonic components
C. Fundamental components
D. Nyquist components

[3.3.10] For the signal $x(t) = \sin\omega_0 t$, what is the Fourier series coefficient a_1?
A. $1/2$
B. $-1/2j$
C. $1/2j$
D. 0

[3.4.3] What phenomenon describes the ripples and overshoot observed near discontinuities when a discontinuous signal is approximated by a truncated Fourier series?
A. The Doppler Effect
B. The Heisenberg Uncertainty Principle
C. The Gibbs Phenomenon
D. The Superposition Principle

[2.4.2] Linear constant-coefficient difference equations are typically used to describe which type of systems?
A. Continuous-time systems only.
B. Nonlinear systems.
C. Discrete-time systems only.
D. Analog systems.

[3.5.1] If $x(t)$ has Fourier series coefficients a_k and $y(t)$ has Fourier series coefficients b_k, what are the Fourier series coefficients for $z(t) = Ax(t) + By(t)$?
A. $Ab_k + Ba_k$
B. $(A + B)(a_k + b_k)$
C. $Aa_k + Bb_k$
D. $a_k b_k$