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Department of Electronics and Telecommunication Engineering
Subject: Signal and System   Subject code: ETC254
Question bank
Unit 1
Introduction to Signal and System

Following are the two mark questions (2 mark)

Q.1. Define signals & system.

Q.2. Give condition to identify TV & TIV system.

Q.3. Plot standard test signals.

Q.4. Define deterministic & random signal.

Q.5. State conditions to verify even/odd signals.

Q.6. Define energy and power in mathematical form.

Following are the six mark questions (6 mark)

Q.1. Explain any four operations on signal.

Q.2. With block dia. Explain following.

 i) Adder ii) Constant multiplier iii) Signal multiplier iv) Unit delay& unit advance

Q.3. Prove that folding & time delaying or advancing of signal are not commutative operations

 for X(n)={1,1,1,1}

Q.4. Give mathematical & graphical representation of following s/g.

 1) Signum function 2) Sinc function 3) Decaying exponential function 4) Triangular wave

Q.5. For following system, check whether it is linear or non-linear.

 i)y(n)= x(n) ii) y(n)= x(-n+2) iii) y(n)= x(-n) iv) y(n)= x(2n)

Q.6. Explain classification of system with example.

Unit 2
System Analysis

Following are the two mark questions (2 mark)

Q.1. Enlist methods of convolution.

Q.2 Define convolution. Gives its importance in system analysis.

Q.3. What is LTI system? Explain.

Following are the six mark questions (6 mark)

Q.1. Compute linear convolution by graphical method.

   x(n)={ 1,2,1,2} h(n)={2,1,2,1}

Q.2. Explain convolution & its properties

Q.3. Explain different methods of convolution.

Q.4. Compute linear convolution by analytical method.

   x(n)={ 1,2,1,2} h(n)={1}

Q.5. Find convolution between ramp and unit step signal

Unit 3

CT and DT System analysis using Fourier transform

Following are the two mark questions (2 mark)

Q.1 Fourier transform of unit step signal .

Q.2. State any two properties of FT.

Q.3. Give condition for FT to exist.

Following are the six mark questions (6 mark)

**Q.1.** Express equation of quadrature Fourier series.

Q.2. Define and explain mathematical tool to convert time domain s/g. to frequency domain.

Q.3. Express eqn of complex exponential Fourier series.

Q.4. Write merits & demerits of FT.

Q.5. What is modulation properly of Fourier transform? Explain its importance in communication .

Q.6. Obtain Fourier series representation of given s/g.
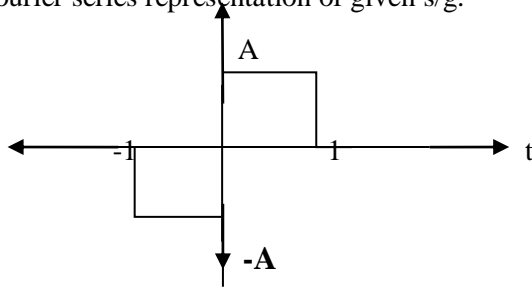
Unit 4
System analysis in Frequency domain using laplace transform

Following are the two mark questions (2 mark)

Q.1. What is region of convergence (ROC).

Q.2. What is transfer function.

Q.3. Relationship between laplace transform and fourier transform.

Following are the six mark questions (6 mark)

Q.1. State and explain any four properties of laplace transform.

Q.2. Find laplace transform of x(t)= e^{-at} cosωt u(t)

Q.3. The transfer function is given by H(s) =$\frac{2S-1}{S^2+3S+2}$ find impulse response of a system.

Q.4. Find the laplace transform of x(t)= e^{-2t} u(t) - e^{2t} u(-t) and plot the ROC

Q.5. The transfer function is given by H(s) =$\frac{S+1}{S^2+3S+2}$ find impulse response of a system.

Q.6. Find laplace transform of x(t)= e^{-at}sinωt u(t)

Unit 5

Correlation

Following are the two mark questions (2 mark)

Q.1. Define correlation &correlogram .

Q.2. How aliasing effect is eliminated in sampling process.

Q.3. What is instantaneous & average normalized power?

Q.4. State properties of autocorrelation.

Q.5. State sampling theorem for band pass signal.

Q.6. Give analogy in between autocorrelation & convolution.

Q.7. What is value of autocorrelation of energy s/g at origin? Explain.

Q.8. Prove that cross correlation is not commutative .

Following are the six mark questions (6 mark)

Q.1. Sketch correlogram of 2 sin t & 2 cost.

Q.2. Determine auto correlation for sequence x(n)= {0,1,2,3}

Q.3. Draw correlogram of sinusoidal signal.

Q.4. Determine cross correlation of X1(n)= {0,1,2,3} X2 (n)={1,2,1,2}

Q.5. Prove that cross correlation in between two energy signal corresponding to multiplication of FT of one s/g & complex conjugate of FT of other s/g.

Unit 6

Energy spectral density and power spectral density

Following are the two mark questions (2 mark)

Q.1. State any two properties of ESD

Q.2. Define ESD& PSD.

Q.3. Define average normalized power.

Following are the six mark questions (6 mark)

Q.1. Prove that, autocorrelation function & PSD forms Fourier transform pair in power signal.

Q.2. Properties of PSD

Q.3. Application of ESD &PSD

Q.4. Prove that, energy signal x(t), ESD & autocorrelation form FT pair.

Q.5. What is ESD? State and prove properties of ESD.

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Subject Teacher