2062

B.E. (Electronics and Communication Engineering)
Eighth Semester
EC-801: Advanced Digital Signal Processing

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt _five_ questions in all, including Question No. 1 which is compulsory and selecting two questions from each Section.

x-x-x

Q:1a)	Find the response of an FIR filter with impulse response h(n) = {1,2,4} to the input sequence x(n) = {1,2}.	(2×5)
b)	Define warping effect. Discuss its significance with a suitable example.	
c)	What are the advantages of polyphase decomposition?	
d)	Why do filters have inherent linear phase characteristics?	
e)	Discuss the stability of the impulse invariant mapping technique.	
Section A		
Q.2a)	Describe time frequency analysis of signals using wavelet transforms. How increasing frequency resolution does decreases time resolution.	(4)
b)	Apply bilinear transformation to $$H(s) = \frac{2}{(s+1)(s+3)} \quad \text{with T= 0.1s}$$	(3)
c)	Give the input – output analysis for a two – channel QMF filter band	(3)
Q.3a)	Write short note on Walsh Transform. Discuss the orthogonality of DCT.	(4)
b)	Obtain the cascade realization of the system characterized by the transfer function $$H(z) = \frac{2(z+3)}{z(z-0.2)(z+0.3)(z+0.4)}$$	(6)
Q.4a)	Compute the FFT for the sequence x(n)= n2 +1 where N=8 using DIT algorithm.	(6)
b)	How can aliasing be avoided in multistage design? Explain with suitable diagrams.	(4)
Section B		
Q.5a)	What is the difference between causal and non causal IIR Wiener filter?	(3)
b)	How is effect of echo minimized in a telephone communication?	(3)
c)	What is Wiener deconvolution? Why Wiener filter is called optimum filter?	(4)
Q.6	Explain the RLS Adaptive Algorithm with suitable mathematical support. How RLS algorithm is different from LMS algorithm.	(10)
Q.7a)	List the family members of the first generation TMS processor and note down the distinguished features. List the enhanced features of the TMS320C5X processor.	(5)
b)	What is the difference between the AR and ARMA? Why is AR model widely used? Discuss	(5)

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