CO/BE/Sem-VII CBSGS/DSP

13-5-16

QP Code : 31256

(3 hours) Total Marks: 80

N.B. 1. Question **No. 1** is compulsory.
2. Attempt any **three** questions out of remaining.
3. Assume suitable data if **necessary** and justify the assumptions.
4. Figures to the **right** indicate full marks.

Q1 A For the given causal sequences x(n) = {8, 9, 2, 3} and h(n) = {4, 3, 6} find the cross correlation. 05

B State the condition for stability of LTI system and determine for the given discrete time system $h(n) = (0.3)^n u(n) + 5\delta(n)$, is stable or not. 05

C Differentiate IIR and FIR systems. 05

D For the causal signal x(n) = {2, 2, 4, 4} compute four point DFT using DIT-FFT. 05

Q2 A Check whether following system $y(n) = 2x(n-1) + x(2n)$ is: 10

1. Linear or non Linear
2. Causal or non-causal
3. Time variant or Time invariant
4. Static or Dynamic

B Draw the radix 2 DIT flow graph and find the DFT of the sequence x(n) = {10, 11, 8, 5} using FFT flow graph. 10

Q3 A For $x(n) = \{2\ 3\ \underset{\uparrow}{4}\ 5\ 1\ 3\}$, plot the following Discrete Time signals: 10

1.) x(n-1) 2.) x(n)u(-n) 3.) x(n-1)u(-n-1)
4.) x(-n)u(n) 5.) x(2n)

B Determine whether or not the following signals are periodic. 10
If periodic specify its fundamental period.

1. $x(n) = \sin(0.25\pi n + 0.4)$
2. $x(n) = \cos(0.5n\pi) + \sin(0.25n\pi)$

Q4 A For the FIR digital filter with impulse response given by 10
h(n) = 2δ(n) + 3δ(n-1) + 4δ(n-3) + δ(n-4) sketch the magnitude response of the filter.

B State any five DFT properties. 10

[TURN OVER]

Q5	A	Find circular convolution of $x_1(n) = \{5, 6, 2, 1\}$ and $x_2(n) = \{3, 2, 1, 4\}$ by computing DFT of $x_1(n)$ and $x_2(n)$.	10
	B	Compute Linear Convolution of causal sequence $x(n) = \{7, 6, 4, 5, 2, 4, 5, 2, 3\}$ and $h(n)=\{1\ 2\ 3\ 1\}$ using fast overlap save method.	10
Q6	A	Write a detailed note on Carls' Correlation Coefficient Algorithm.	10
	B	Write a detailed note on DSP Processor and Architecture.	10