Vidyavardhini's College of Engineering & Technology, Vadai(w)
Department of Electronics & Telecommunication Engineering

Curriculum Scheme: Rev2016

Examination: SE Semester: III

Course Code: ECC504 and Course Name: Electronic Discrete Time Signal Processing

Time: 2 Hour Max. Marks: 80

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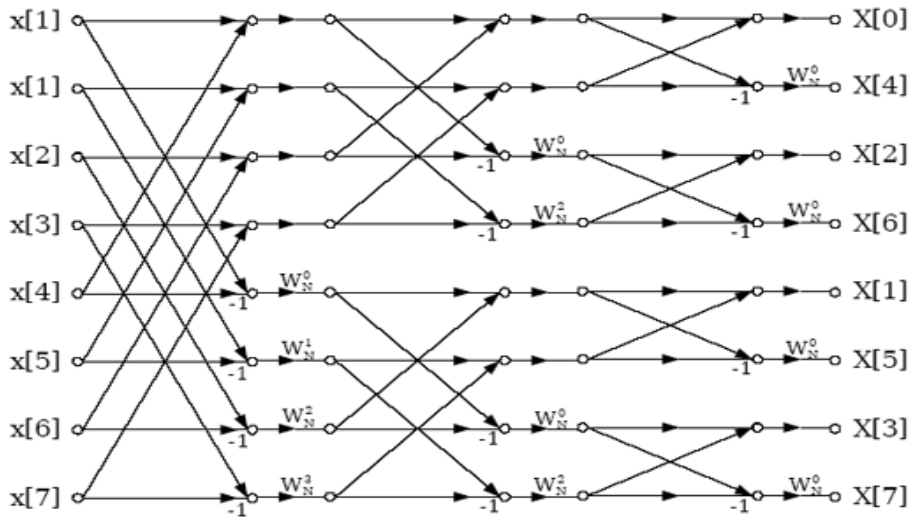
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Radix - 2 FFT algorithm performs the computation of DFT in
Option A:	$N/2Log_2 N$ multiplications and $2Log_2 N$ additions
Option B:	$N/2Log_2 N$ multiplications and $NLog_2 N$ additions
Option C:	$Log_2 N$ multiplications and $N/2Log_2 N$ additions
Option D:	$NLog_2 N$ multiplications and $N/2Log_2 N$ additions
2.	In which type of computation following butterfly diagram is used 
Option A:	Linear Convolution using DFT and IDFT
Option B:	Decimation in Time FFT
Option C:	Circular Convolution using Time domain method
Option D:	Decimation in Frequency FFT
3.	The transformation technique in which there is many to one mapping from s-domain to z-domain is
Option A:	Bilinear transformation method
Option B:	Impulse Invariant Method
Option C:	Butterworth Method
Option D:	Sampling Method
4.	Which of the following substitution is done in Bilinear transformations?
Option A:	$s = \frac{2}{T}[\frac{1+Z^{-1}}{1-Z^{-1}}]$
Option B:	$s = \frac{2}{T}[\frac{Z^{-1}}{1+Z^{-1}}]$
Option C:	$s = \frac{2}{T}[\frac{1-Z^{-1}}{1+Z^{-1}}]$

Option D:	s = $\frac{2}{T}[\frac{1}{1+Z^{-1}}]$
5.	Which of the following is not suitable either as low pass or a high pass filter?
Option A:	h(n) symmetric and M odd
Option B:	h(n) symmetric and M even
Option C:	h(n) anti-symmetric and M odd
Option D:	h(n) anti-symmetric and M even
6.	What is the approximate transition width of main lobe of a Hamming window?
Option A:	4π/M
Option B:	8π/M
Option C:	12π/M
Option D:	2π/M
7.	The quality of output signal from A/D converter is measured in terms of _____
Option A:	Quantization error
Option B:	Quantization to signal noise ratio
Option C:	Signal to quantization noise ratio
Option D:	Conversion constant
8.	Quantizing products leads to errors, popularly known as
Option A:	Aliasing
Option B:	Input errors
Option C:	Round-off errors
Option D:	Floating errors
9.	The length of the truncated filter should be
Option A:	M
Option B:	M-1
Option C:	Infinite
Option D:	M+1
10.	Which type of architecture uses different storage space for program code and the data?
Option A:	Von Neumann architecture
Option B:	Harvard architecture
Option C:	Fragmented architecture
Option D:	Split cell architecture
11.	In Overlap save method of long sequence filtering, what is the length of the input sequence block?
Option A:	L+M-1
Option B:	L+M
Option C:	L
Option D:	L-M-1
12.	FIR filter is -------.
Option A:	Stable
Option B:	Causal

Option C:	stable and causal
Option D:	stable and non causal
13.	Which of the following windows has a time domain sequence $h(n) = \frac{1}{2}(1 - cos\frac{2\pi n}{M-1})$?
Option A:	Bartlett window
Option B:	Blackman window
Option C:	Rectangular window
Option D:	Hanning window
14.	**For the T.F $(Z)\frac{Z}{Z-0.9}$, Which of the following statement is correct?**
Option A:	The system is maximum phase system
Option B:	The system is minimum phase system
Option C:	The system is all pass system
Option D:	The system is mixed phase system
15.	Which one is the common variable for EEG & ECG?
Option A:	Time
Option B:	Special coordinates
Option C:	Pressure
Option D:	Temperature
16.	If Transfer Function $\boldsymbol{H(Z)} = \frac{(z+0.9)}{(z-0.9)(z-0.8)}$. Determine the stability of system based on location of pole zero.
Option A:	Stable
Option B:	Unstable
Option C:	Marginally Stable
Option D:	None of the above
17.	If Transfer Function $\boldsymbol{H(Z)} = \frac{(z+0.9)}{(z-0.9)(z-0.8)}$. Determine the stability of system based on location of pole zero.
Option A:	Stable
Option B:	Unstable
Option C:	Marginally Stable
Option D:	None of the above
18.	If three co-efficients of $h_d(n)$ for length 5 are {0.005, 0.2, 0.25}, remaining coefficient of $h_d(n)$ for rectangular windows are of linear phase FIR filter are
Option A:	{0.05, 0.2, 0.25}
Option B:	{0.2, 0.005}
Option C:	{0.05, 0.2}
Option D:	{0.25,0.2, 0.005}
19.	Identify the function of MAC unit (frame multiple choice)
Option A:	Multiply and Add data in one cycle
Option B:	Multiply and Add data in multiple cycle

Option C:	Multiply, Shift data and add data in one cycle
Option D:	Multiply and Shift data in multiple cycle
20.	Determine value of analog frequency Ωc when digital frequency Wc= 0.2π rad and Ts=1sec using Bilinear Transformation.
Option A:	0.65 rad/sec
Option B:	1 rad/sec
Option C:	0.65 rad
Option D:	1 rad

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	*Design digital Butterworth Filter to satisfy the following conditions:* $0.707 \leq \lvert H(w) \rvert \leq 1 \quad 0 \leq W \leq 0.2\,\pi$ $\lvert H(w) \rvert \leq 0.1 \quad 0.5\,\pi \leq W \leq \pi$ *Use Bilinear Transformation and assume Ts= 1sec.*
B	*Design a linear phase FIR low Pass filter of length 7 and cut off frequency 10 1 rad/sec using Hamming Window*
C	*Find the DFT X(K) of sampled data sequence x(n) = {1,2,3,4}* *Determine DFT of x1(n) and x2(n) and x3(n)* *using X(K) only.* *x1(n)= {4,1,2,3}* *x2(n)= {2,3,4,1}* *x3(n)= {6,4,6,4}*

Q3.	
A	**Solve any Two** **5 marks each**
i.	Explain application of DSP processor to radar signal processing.
ii.	*Differentiate Fixed point and floating-point implementation.*
iii.	Compare IIR and FIR digital filters
B	**Solve any One** **10 marks each**
i.	Architecture of TMS320C67XX digital signal processor
ii.	Effect of finite word length in digital filters