Register Number: …….

B.E. DEGREE EXAMINATIONS: NOV/DEC 2012

Fifth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

ECE261: Digital Signal Processing

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Which term applies to the maintaining of a given signal level until the next sampling?

   a) Holding b) Aliasing c) Shannon frequency sampling d) Stair stepping

2. What is the result of taking more samples during the quantization process?

   a) More errors in the analog-to-digital conversion

   b) More bit requirements

   c) More accurate signal representation

   d) More bit requirements and more accurate signal representation

3. Which type of programming is typically used for digital signal processors?

   a) Assembly language b) Machine language c) C d) Java

4. The Z transform x(n) is x(2) then Z transform of $(0.5)^n$ x/n

   a) x(0.5z) b) x(2z) c) $x(2^{-1}z)$ d) 0.5 x(z)

5. To find linear convolution from circular convolution, x(n) must has _____ samples.

   a) L-1 b) M-1 c) L+M-1 d) L+M

6. The ROC of x(n) should contain

   a) Poles b) zeros c) no poles d) no zeros

7. The value of W_8^2 is

   a) 1 b) 0 c) -0.707+jo.707 d) 0.707-jo.707

8. If a filter allows frequency w1 to w2 and stop all other frequencies it is

   a) LPF b) HPF c) BSF d) BPF

9. In DSP processor has a specific module compared to other controllers.

   a) Decoder b) ALU c) MAC d) None of the above

10. For the given sequence x(n) = {0,1,2,3,4}, x(-1) is

    a) 0 b) 1 c) 2 d) 3

PART B (10 x 2 = 20 Marks)

11. Test if the following systems are linear y (n) = x(n) coswn.
12. What is aliasing effect?
13. If x (e^{JW}) is the Fourier transform of x (n), find the Fourier transform of x (-n).
14. Find the Z – transform of the sequence X (n) = {1, 2, -3, 1, 0, 3, 2, 1}
15. When the DFT X (x) of a sequence x (n) is real?
16. Calculate the number of multiplication of DFT & FFT with 64 – point sequence.
17. What are the properties of Chebyshev filters?
18. What is warping effect? What is its magnitude 0 & phase response?
19. Define convolution?
20. Obtain linear convolution of the sequences x (n) = {1, 2, 3}, h(a) = {-1, -2} using circular convolution.

PART C (5 x 14 = 70 Marks)

21. a) (i) Determine the stability of the system.

Y(n) - y (n-1) + y (n-2) =x (n) –x (n-1) (10)

(ii) Write short notes on ADC process? (4)

(OR)

b) A causal LTI system is described by the difference equation y (n) – ay (n-1) = bx (n) + (n-1)Where is real and less them 1 in magnitude? Find a value of b(a≠b) such that the frequency response of the system satisfies |H. (e^{JW})|= 1 for all 0.

22. a) Find inverse Z – transform of X(Z) = $\frac{2}{Z(Z-1/2)}$ for ROC; 1 1 >1/2 using residue method.

(OR)

b) Evaluate the convolution y(n) = $x(n) * h(n)$ of the sequence .

h(n)= {1,2,3,4,5,6}

x(n) = {-1,-2,3,5,7,1}

23. a) Compute the eight point DFT of the sequence.

$x(n) = \{0.5, 0.5, 0.5, 0.5, 0, 0, 00\}$ using the inplace radix – 2 DIT algorithm

(OR)

b) Find the 8-point DFT of the given sequence

$(n) = \{0, 1, 2, 3, 4, 5, 6, 7\}$ using DIF, radix – 2 , FFT algorithm .

24. a) Design a chebyshev filler for the following specification using bilinear transformation.

(OR)

b) Realite these and order system

$Y(n) = 2rCos(w_o)\, Y(n-1) - r^2\, Y(n-2) + x(n) - rcos(w_o)\, x(n-1)$ in direct form II

25. a) Draw and explain TMS32C54XX DSP architecture also mention its features.

(OR)

b) (i) Write Matlab program for linear convolution. (7)

(ii) Write Matlab program for 8point DFT. (7)

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