ANNA UNIVERSITY COIMBATORE

B.E./ B.TECH. DEGREE EXAMINATIONS : MAY / JUNE 2010

REGULATIONS : 2007

SIXTH SEMESTER : EEE

070280057 - DIGITAL SIGNAL PROCESSING

TIME : 3 Hours

Max.Marks : 100

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. State the advantages of DSP.
2. Define signal with example.
3. Define nyquist rate.
4. State the classification of discrete signals.
5. Differentiate bilateral and unilateral Z-transform.
6. Distinguish between fourier series and fourier transform.
7. Find the z-transform of x(n)={1,0,3,-1,2}
8. Determine the z-transform & ROC of $x(n)=a^n u(n)$
9. Define DFT.
10. State any 4 properties of DFT.
11. State the difference between DIT and DIF.
12. Draw the butterfly structure of radix-2 DIT FFT algorithm.
13. What are recursive filters. Give example
14. State the different realization structure of IIR filter.
15. What are the drawbacks of direct form I&II.
16. Define Prewarping.
17. Name the 4 buses of TMS320C54 signal processing.
18. What are the two broad categories of DSP processors.
19. Define Pipelining.
20. State the elements of Central processing unit of TMS320C54 signal processing

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21. a Explain the classification of discrete time systems. 8

    b Find the linear convolution of x(n)={2,6,1,10,4,3} and h(n)={9,8,7,6,5,4} 4

22. a Determine the fundamental period of $x(n)=\text{Sin}2\pi n/3 +\text{Cos}\pi n/2$ 8

    b Find the response of an LTI system with the impulse response 4
       $h(n)= \delta (n)+2\delta (n-1)$ for the input x(n)={1,2,3}

23. Perform circular convolution using DFT and IDFT.
    X(n)={2,1,2,1} and h(n)={1,2,3,4}

24. An 8 point sequence is given by x(n)={2,2,2,2,1,1,1,1}.Compute 8 point DFT
    using radix-2 DIT FFT algorithm and also sketch the magnitude and Phase
    Spectra.

25. Given that y(-1)=5,and y(-2)=0.Solve the difference equation
    y(n)-3y(n-1)-4y(n-2)=0.

26. a   Use bilinear transform to design a first order low pass filter with 3db cutoff   8
frequency of 0.2π

b   Obtain the Cascade realization of FIR filter   4
$H(z)=1+5/2\ z^{-1}+2z^{-2}+2z^{-3}$

27   Design an ideal filter transform having frequency $H(e^{j\omega})= j$ for $-\pi \le \omega \le 0$
$-j$ for $0 \le \omega \le \pi$

Using rectangular window for N=11

28   Describe the Harvard architecture of TMS 320C54 signal processing chip.

*****THE END*****