

Please check whether you have got the right question paper.

- N.B:**
1. Question.No.1 is compulsory.
  2. Solve any three from remaining five question
  3. Assume suitable data if required.

- Q1.** Answer the following any four. 5x4=20
- a)  $y(n)-5y(n-1)+6y(n-2)=x(n)$  Determine system function & Impulse response
  - b) Explain Block diagram of DSP
  - c) Compute DFT of four point sequences  $x(n)=\{2,4,5,6\}$
  - d) Write the condition of Hamming and hanning window techniques.
  - e)  $H(s)=1/(s+3)(s+6)$  find  $H(z)$  using impulse invariance techniques
- Q2.**
- a) Prove the circular frequency shift and time shift properties of DFT (10)
  - b) If  $x(n)=\{3,0,-2,0,2,1,0,-2,-1,0\}$  and  $h(n)=\{2,2,1\}$  perform overlap save method. (10)
- Q3.**
- a) Find the 8 point DFT using DIT-FFT algorithm. (10)  
 $X(n)=\{1,2,1,2,0,2,1,2\}$
  - b) Derive the relationship of DFT to F.T and Z.T (10)
- Q4.**
- a) Realize the system using DF-II, cascade and parallel realization (10)
- $$H(z) = \frac{1 + \frac{1}{3} z^{-1}}{1 - \frac{3}{4} z^{-1} + \frac{1}{8} z^{-2}}$$
- b) Obtain the magnitude and phase response of the following system (10)  
 $H(n)=(-1/2)^n u(n)$
- Q5.**
- a) A low pass Butterworth filter has following specification
 

$0.8 \leq  H(e^{j\omega})  \leq 1$	for $0 \leq \omega \leq 0.3 \pi$
$ H(e^{j\omega})  \leq 0.2$	for $0.7 \pi \leq \omega \leq \pi$

 Find the filter order and analog cut off frequency  $\Omega_0$  if
    - (i) Bilinear transformation techniques
    - (ii) Impulse invariance techniques. (10)
  - b) Prove the derivation of FIR filter when
    - (i) N is even & symmetric
    - (ii) When N is odd and anti symmetric (10)
- Q6**
- a) Write a short note on Comb filter & notch filter.
  - b) Write a short note on Decimation by integer factor
  - c) Explain any one DSP processor in detail (6+6+8)