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FIRST- SEMESTER
SUPPLEMENTARY EXAMINATION

M.Tech (VLSI)
FEB-2019

EC-562 [DIGITAL SIGNAL PROCESSING]

TIME: 03 Hrs   **Maximum Marks:100**

Attempt any five questions. Assume suitable missing data if any.

Q. 1(a) How to obtain the DC gain and high frequency gain of a filter from various representation of impulse responses.   [10]

(b) Discuss the sources of Gibb phenomenon in digital filters. State it's remedial.   [10]

Q.2(a) What is meant by multirate signal processing? How a up sampler and down sampler can be designed.   [10]

(b) By using overlap and save method, find out the output of the filter $h(n)$ = [1,3,4], when the input $x(n)$ = [1,2,3,2,3,4,1,2,0,1 2,2].   [10]

Q.3 (a) Find 4-point DFT $X(k)$ for $x(n)$ = [1,1] by using DIT algorithm. Discuss the radix-2 butterfly computation using DIF?   [10]

(b) Find $x(n)$ for $X(k)$ = [1, 2, 3, 4] by using direct computation.   [10]

Q.4(a) Realize the following second order FIR system using the form-1 and form-2 form structure. $y(n)=3x(n)+5x(n-1)-2x(n-2)- 2y(n-1)$.   [10]

(b) Give the linear phase realization for the filter $h(n)=[1,3/4,17/8,3/4,1$. What is the advantage of a linear phase structure?   [10]

Q.5 (a) If $y(n)=[1,7/10]$ and $x(n)=[1,-7/10,1/10]$ than find out the impulse response of the filter. Analyse the causality and stability of the filter.   [10]

(b) Explain the technique used for obtaining the transfer function of a ideal HP, BP and BS filter from ideal LP filter.   [10]

Q.6 (a) design of a IIR filter by using approximation of derivatives. State its limitation and advantage.   [10]

(b) Write short notes on
      (i) Group delay and phase delay
      (ii) Minimum phase and maximum phase filter   [10]

END