

**B. Tech. Sem -VI (E & TC Engg.) (2014 COURSE) (CBCS) :**  
**SUMMER - 2019**  
**SUBJECT: DIGITAL SIGNAL PROCESSING**

Day : Wednesday  
 Date : 22/05/2019

**S-2019-2777**

Time: 02.30 PM TO 05.30 PM  
 Max Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagram **WHEREVER** necessary.
- 4) Assume suitable data, if necessary.

**Q.1** What are the advantages of digital filter over analog signal processing? **(10)**

**OR**

**Q.1** Explain the stability and causality frequency response of LTI system? **(10)**

**Q.2** Find 8-point DFT of sequence **(10)**

$$X(n) = \{1 \ 2 \ 3 \ 4\}$$

Also draw magnitude and phase response?

**OR**

**Q.2** Find Y(n) by overlap save of following sequence **(10)**

$$H(n) = \{1, 1, 2, 2\}$$

$$X(n) = \{1 \ -1 \ 1 \ 2 \ 1 \ 0 \ 1 \ 1 \ -4 \ 3 \ 2 \ 1 \ 0 \ 1 \ 1\}$$

**Q.3** Design FIR- LPF using hamming window **(10)**

$$H(e^{j\omega}) = 1 \quad \text{for } |\omega| \leq \pi/6$$

$$= 0 \quad \text{otherwise}$$

For N = 11 plot magnitude response.

**OR**

**Q.3** Design LPF using frequency sampling method for cut off frequency of 500Hz. The sampling frequency is 2000 samples/ sec and the filter length equal to 11. **(10)**

**Q.4** A analog filter with system function **(10)**

$$H(s) = \frac{S + 0.1}{(S + 0.1)^2 + 25}$$

In to digital filter by IIM method?

**OR**

**Q.4** Design Butterworth LPF for **(10)**

$$0.89125 \leq |H(e^{j\omega})| \leq 1; \quad 0 \leq |\omega| \leq 0.2\pi$$

$$\leq |H(e^{j\omega})| \leq 0.17783; \quad 0.3\pi \leq |\omega| \leq \pi$$

**Q.5** Plot the spectral characteristics of the quantization error observed in the process of rounding and truncation for fixed point representation? **(10)**

**OR**

**Q.5** How to minimizing the finite word length effects? **(10)**

**Q.6** Explain any five application of DSP? **(10)**

**OR**

**Q.6** Explain TMS320C67XX in DSP processor? **(10)**

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