Code No: RT32042   **R13**   SET - 1

III B. Tech II Semester Supplementary Examinations, April/May -2019
DIGITAL SIGNAL PROCESSING
(Electronics and Communication Engineering)

Time: 3 hours   Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**
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PART –A

1 a) What are the conditions for stability and causality of an LSI system?   [4M]
   b) Define DFT and IDFT   [3M]
   c) Find the z transform of $x[n] = \sin[\omega_o n] u[n]$.   [4M]
   d) What is the necessary and sufficient condition for linear phase Characteristics of an FIR filter?   [4M]
   e) What is meant by aliasing? How to avoid it?   [3M]
   f) What are the advantages of VLIW architecture?   [4M]

PART -B

2 a) Determine the frequency response, and time delay of the systems given by   [8M]
   $$y(n) - \frac{1}{2} y(n-1) = x(n)$$
   b) What is the significance of convolution? Explain   [8M]

3 a) Compute the DFTs of the sequence $x(n) = 2^{-n}$, where N = 8 using DIT algorithm.   [8M]
   b) State any four properties of DFS and prove them   [8M]

4 Realize the following IIR system in the direct form I, direct from II and parallel forms.   [16M]
   $$H(z) = 1/(1 + az^{-1})(1 - bz^{-1})$$

5 a) The desired frequency response of a low pass filter is   [8M]
   $$H_d(e^{jw}) = \begin{cases} 1; \dfrac{-\pi}{2} \leq w \leq \dfrac{\pi}{2} \\ 0; \dfrac{\pi}{2} \leq w \leq \pi \end{cases}$$ Determine $h_d(n)$ for M = 7 using a rectangular window
   b) Explain FIR filter design using windowing method.   [8M]

6 a) Explain the following terms: i) Decimation ii) interpolation.   [8M]
   b) What are the applications of Multi rate system? Explain.   [8M]

7 a) What are the various addressing modes used in the TMS320C5X processor?   [8M]
   b) What are the limitations of pipelining in Digital Signal Processor?   [8M]

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