

Code: R7311902

R7

B.Tech III Year I Semester (R07) Supplementary Examinations, May 2013

DIGITAL SIGNAL PROCESSING

(Electronics and Computer Engineering)

Time: 3 hours

Max Marks: 80

Answer any FIVE questions
All questions carry equal marks

- 1 Check whether the systems described by the following equations are causal
 - (i) $y(n) = 3x(n - 2) + 3x(n + 2)$
 - (ii) $y(n) = x(n - 1) + ax(n - 2)$
 - (iii) $y(n) = x(-n)$
 - (iv) $y(n) = 3y^2(n - 1) - nx(n) + 4x(n - 1) - 2x(n + 1)$

- 2 Determine the DFT of a sequence $x(n) = \{1, 1, 0, 0\}$ and check the validity of answer by calculating IDFT.

- 3 Explain radix 2 DIT-FFT algorithm in detail. Explain how calculations are reduced.

- 4 (a) Discuss the realization of FIR filter structures.
 (b) Realize FIR filter with system function in cascade form:

$$H(z) = 1 + (5/2)z^{-1} + 2z^{-2} + 2z^{-3}.$$

- 5 (a) Discuss the characterization of IIR filter.
 (b) Using backward difference method obtain $H(z)$ for following:

$$H(s) = 1/(s + 2)$$

- 6 (a) Discuss about characteristics linear phase FIR filters.
 (b) What are the effects of windowing?

- 7 Implement a two stage decimator for the following specifications. Sampling rate of the input signal = 20,000 Hz.
 - $M = 100$
 - Pass band = 0 to 50 Hz
 - Transition band = 50 to 70 Hz
 - Pass band ripple = 0.01
 - Stop band ripple = 0.002

- 8 (a) Explain the data transfer using TDM channel.
 (b) What are the advantages of CISC?
