**Code: 9A04603**

**R09/SS**

B.Tech IV Year I Semester (R09) Supplementary Examinations June 2016

**DIGITAL SIGNAL PROCESSING**

(Electrical & Electronics Engineering)

Time: 3 hours Max. Marks: 70

Answer any FIVE questions

All questions carry equal marks

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1 Check for causality and stability of following systems:

(a) $y(n) = x(n) + x(n-1) + x(n-2)$

(b) $y(n) - 2y(n-1) = x(n)$

2 Given the two sequences of length '4' as under:

$x(n) = \{0,1,2,3\}$

$h(n) = \{2,1,1,2\}$.

Verify the answer using DFT method.

3 (a) What are the twiddle factors? Explain

(b) Find DFT of sequence using DIT-FFT:

$x(n) = \{1/2,1/2,1/2,1/2,0,0,0,0\}$

4 State and prove following properties of z-transform

(a) Time shifting.

(b) Multiplication in time domain.

(c) Scaling in z-domain.

5 (a) Compare Butter worth and Chebyshev filter approximations.

(b) Use Bilinear Transformation method to find H(z) for:

$H(s) = 1/ (s + 0.5)^2$

6 (a) Explain the Type – I frequency sampling method of designing FIR filter.

(b) Explain the Gibb's phenomenon.

7 Implement a two stage decimator for the following specifications. Sampling rate of the input signal = 21,000 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) Discuss about musical sound processing.

(b) With necessary block diagrams explain about Discrete Multi Tone transmitter.

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