SL - 781

Seat No.	

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T.E. (Electronics and Telecommunication) (Semester - VI) Examination, April - 2017

DIGITAL SIGNAL PROCESSING (Revised)

Sub. Code : 66916

Day and Date : Wednesday, 26 - 04 - 2017 **Total Marks : 100**

Time : 02.00 p.m. to 05.00 p.m.

Instructions: *1) All Questions are compulsory.*

2) Figures to right indicates full marks.

3) Assume suitable data if required.

Q1) Attempt any Two: **[18]**

a) State the properties of DTFT. Explain any four in detail.

b) What is sectioned convolution? Explain in detail overlap-save method.

c) By using DFT and IDFT find the response of FIR filter for the given sequence x(n)= (2,1) and h(n)= (1,2).

Q2) Attempt any Two: **[16]**

a) Find y(n) = x(n)) *h(n) for sequence x(n)= (1,2,-1,2,3,-2,-3,-1,1,1,1,2,–1) and h(n)= (1,2) using overlap add method.

b) Explain DIF FFT algorithm.

c) Determine 4 point DFT of a sequence x(n)= (1,2,4,6).

Q3) Attempt any Two: **[16]**

a) Describe windowing method for FIR filter design..

b) Design linear phase FIR filter using Hanning window for the following desired frequency

response: $H_d(\omega) = e^{-j3\omega}$, $\pi/4 \le |\omega| \le \pi$

= O otherwise for filter length 7

c) Explain frequency sampling method for FIR filter design.

P.T.O.

Q4) Attempt any Two: **[18]**

a) For the analog transfer function $H(s) = 1/ (s+1)(s+2)$, Determine H(z) using impulse invariant technique. Assume T= 1 sec.

b) Explain Impulse invariant method of IIR filter design.

c) Apply BLT method to obtain digital low pass filter to approximate $H(s) = 1/ s^2 + \sqrt{2}\ s + 1$ Assume cut-off frequency of 100 Hz and sampling frequency of 1 KHz.

Q5) Attempt any Two: **[16]**

a) Explain the concept of direct form realization of FIR filter.

b) State realizations of IIR filter. Explain any one in detail.

c) Obtain cascade realization of system functions:

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

ii) $H(z) = (1 + 2z^{-1} - z^{-2})\ (1+z^{-1} - z^{-2})$

Q6) Attempt any Two: **[16]**

a) Explain general DSP processor with block diagram.

b) Compare general purpose and DSP processors.

c) Explain different architectures of DSP's.

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