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BIEL-010

00170

B. Tech. ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

Term-End Examination

June, 2013

BIEL-010 : DIGITAL SIGNAL PROCESSING

Time : 3 Hours *Maximum Marks : 70*

Note : *Answer **any seven** questions. Each question carries **ten** marks. **Use** of scientific calculator is permitted.*

1. (a) Explain various properties of DFT. 5

(b) Compute the inverse DFT of $x(k) = [1, 2, 3, 4]$. 5

2. Discuss the linear filtering methods using DFT by overlap - Save method. **10**

3. Discuss Goertzel algorithm for computation of DFT by Linear filtering. **10**

4. Determine 4 - Point DFT of $x(n) = [1, 2, 3, 4]$ using DIT FFT flow graph. **8+2=10**

Why FFT algorithms are faster than direct computation of DFT ?

5. (a) Discuss the advantages of Digital filters. 3

(b) Discuss the impulse invariant method for designing IIR filter. 7

6. The transfer function of a analog filter is 10

$$H_a(S) = \frac{3}{(S+2)(S+3)}, \text{ with } T = 0.1 \text{ sec.}$$

Design the digital IIR filter using Bio - linear Transformation.

7. (a) Explain the effect of truncating an infinite fourier series into a finite series. 5

(b) What is Hamming window functions ? Obtain its frequency domain characteristics. 5

8. What do you mean by linear phase filters ? Derive the condition for the same. State its advantages. 10

9. Realize the system given by difference equation $y(n) = -0.1y(n-1) + 0.72y(n-2) + (0.7)x(n) - 0.25x(n-2)$, in parallel form. 10

10. Write notes on *any two* of the followings : 5+5=10

(a) Matched z - Transform.

(b) Transposed form of realization,

(c) Circular convolution and its applications.