18/11/13

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Roll. No.	

B.E/B.TECH (Full Time) DEGREE EXAMINATIONS NOV/DEC 2013

Branch; Electronics & communication Engineering

V semester

EC9304 Digital signal Processing

(Regulation 2008)

Time : 3 hour Max. Mark: 100

Answer ALL questions
Part – A (10 x 2 =20 Marks)

1. What are the differences between DIT and DIF filter?
2. What are the properties of DFT of a real signal?
3. What is prewarping?
4. What are the properties of Butterworth and chebychev filter?.
5. What are the advantages and disadvantages of FIR and IIR filter?
6. What is the need for window function?
7. What is scaling? When do you need?
8. Define truncation and rounding.
9. State two important lemma of upsampling and downsampling
10. A signal having maximum frequency of 400 hz is sampled 8000 samples/second. If this signal is downsampled by M What is the value of M to avoid aliasing error?

Part – B (5 x 16 = 80 Marks)

11 a) Explain the radix-2 Decimation in Frequency algorithm in detail (8)

b) Compute the 8 point DFT of the given sequence x(n) = (1, 0, 0, 0, 0, 0, 0, 0) using DIT FFT algorithm (8)

12 a i) How do you convert a low pass filter into HP, BP,BS filter? (6)

ii) what are the methods to convert an analog filter into digital filter? Explain in detail. (10)

(OR)

b) For the given specifications design a digital Butterworth filter

$0.9 \leq |H(j\Omega)| \leq 1 \quad 0 \leq \Omega \leq 0.2\pi$

$|H(j\Omega)| \leq 0.2 \quad 0.4\pi \leq \Omega \leq \pi$

assume T= 1 sec. (16)

13.a i) Realise an third order IIR filter using direct form-II structure. (8)

ii) Explain overlap-add and overlap-save method with an example.(8)

(OR)

b) Design an FIR linear phase digital filter approximating the ideal frequency response,

$H_d(e^{j\omega}) = e^{-j3\omega}, \quad -\pi/2 \leq |\omega| \leq \pi/2$

$0, \quad \pi/2 < |\omega| \leq \pi$

using hamming window method with N=11. (16)

14 a i) Explain zero limit cycle oscillation with an example. (8)

ii) explain the quantization noise in different number representation in detail. (8)

(OR)

14 b) Draw any one of the architecture TMS320c5xxx or TMS320c6xxx and explain the special feature of the processor. (16)

15 a i)Explain the operation of downsampler and upsampler . (8)

ii) Draw the type1 and type-2 structure to realize a decimator. (8)

(OR)

15 b i) Explain polyphase decomposition in detail. (8)

ii) Explain any two applications of multirate signal processing. (8)