BTS(C) – VI– (S) - 09 – 045 – O

B. Tech Degree VI Semester (Supplementary) Examination, October 2009

CS 601 COMPILER CONSTRUCTION

(2006 Scheme)

Time : 3 Hours   Maximum Marks : 100

PART A

(Answer all questions)

(8 x 5 =40)

I.
- a. Briefly explain the role of a lexical analyzer.
- b. Write short notes on the different compiler construction tools.
- c. Explain the role of the parser.
- d. Write short note on the parser generator YACC.
- e. Describe synthesized attributes and inherited attributes.
- f. What are activation records? Explain.
- g. What are the different criteria for code improving transformations?
- h. Write short notes on
  - i. Copy propagation
  - ii. Dead code elimination

PART B

(4 x 15 =60)

II. What is a compiler? With a neat diagram explain the different phases of a compiler.

OR

III. With a suitable example explain how do you recognize tokens.

IV. What is top down parsing? Explain any two top down parsing methods.

OR

V. Explain Operator-Precedence Parsing.

VI. Explain the different storage allocation strategies.

OR

VII. Explain the different parameter passing methods.

VIII. What is three address code? Explain the types of three address statements and their implementations.

OR

IX. Explain the different issues in the design of a code generator.

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B.Tech. Degree VI Semester (Supplementary) Examination, October 2009

CS/EC/EI/EE 601 DIGITAL SIGNAL PROCESSING

(1999 Scheme)

Time: 3 Hours Maximum Marks: 100

I. (a) Define
(i) linearity (ii) causality (iii) time invariance of discrete systems (8)

(b) Find the inverse z transform of

$$X(z)=\frac{1+2z^{-1}+z^{-2}}{1-\frac{3}{2}z^{-1}+\frac{1}{2}z^{-2}} \quad x[n] \quad \text{causal}$$ (12)

OR

II. (a) What is system function? What is its significance? (6)

(b) Why can't ideal filters be realized? (4)

(c) Find the inverse z transform of $x[n]$ of $X(z)=\frac{1}{1-az^{-1}}$ by long division, where $x[n]$ is an anticausal sequence. What is its R.D.C? (10)

III. (a) Describe the block convolution method using overlap add and overlap save schemes. (12)

(b) Find the total multiplications and additions (complex as well as real) for computing an N point DFT. What is the computational saving when N is a power of 2 and radix 2 FFT is used. (8)

OR

IV. (a) Show using a numerical example that circular convolution is linear convolution followed by time aliasing. (10)

(b) Draw the signal flow graph for an 8 point Radix – 2 DIT FFT. (10)

V. (a) Show that FIR filters can be designed with constant phase delay and constant group delay. (10)

(b) Discuss the windowing method of FIR filter design. What is Gibb's phenomenon? (10)

OR

VI. (a) Compare IIR and FIR filters. (10)

(b) Discuss the frequency sampling technique for FIR filter design. (10)

VII. (a) Implement the following filter in Direct form I, Direct form II and Cascade (12)

$$H(z)=\frac{1+0.75z^{-1}+0.125z^{-2}}{1-1.75z^{-1}+0.875z^{-2}-0.1251z^{-3}}$$

(b) Discuss the Bilinear transformation method. What is frequency warping. (8)

(Turn Over)

OR

VIII.	(a)	Compare the characteristics of direct form 1, direct form 2, cascade and parallel forms of realizing IIR filters.	(10)
	(b)	Determine the order and poles of a Low pass Butter worth filter that has a 3 dB attenuation at 500 Hz and an attenuation of 40 dB at 1000 Hz.	(10)
IX.	(a)	Draw and explain the block diagram of a typical DSP processor.	(10)
	(b)	What do you mean by limit cycle oscillation. Illustrate with example.	(10)

OR

X.	(a)	Discuss any two DSP applications.	(12)
	(b)	Explain the need for scaling the input signal in saturated arithmetic.	(8)

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B.Tech. Degree VI Semester (Supplementary) Examination, October 2009

CS/EI/EE 601 DIGITAL SIGNAL PROCESSING

(2002 Scheme)

Time: 3 Hours Maximum Marks: 100

I a) (i) Find the convolution of the signals

$$x(n)=1 \quad \text{for } n=0,1$$
$$=2 \quad \text{for } n=2,3$$
$$=0 \quad \text{elsewhere}$$

$$h(n)=\delta(n)-\delta(n-1)+\delta(n-2)-\delta(n-3)$$ (5)

(ii) Determine the response of the initially relaxed system characterized by the impulse response $h(n)=(1/2)^n u(n)$ to the input signal $x(n)=2^n u(n)$. (5)

b) Check the linearity, time invariance, causality and stability of the following systems

i) $y(n)=n\,x(n)$

ii) $y(n)=\cos w_o n$ (10)

OR

II a) (i) Write short notes on system function. (5)

(ii) State and explain the time reversal and differentiation property of z – transform. (5)

b) Find the inverse z – transform of $X(z)=\dfrac{z(z^2-4z+5)}{(z-3)(z-1)(z-2)}$ for ROC

(i) $2<|z|<3$ (ii) $|z|>3$ (iii) $|z|<1$ (10)

III a) (i) Perform the circular convolution of the following sequences

$$x(n)=\{1,-1,\ 2,-2\} \quad h(n)=\{1,2,3,4\}$$ (5)

(ii) Explain the relationship of DFT to Z – transform. (5)

b) Find the linear convolution of the sequences

$x(n)=\{1,-1,2,-2,3,-3,4,-4,5,-5,6,-6\}$ and $h(n)=\{1,1\}$

using overlap add method. (10)

OR

IV a) Explain DIF FFT algorithm. (10)

b) Determine the DFT values of the sequence $x(n)=\{2,2,2,2,1,1,1,1\}$ using radix 2 DIT FFT algorithm. (10)

V a) (i) Explain Gibbs oscillations. (5)

(ii) Write short notes on windowing. (5)

b) Explain frequency sampling method of FIR filter design. (10)

OR

(Turn over)

VI a) Design an ideal low pass filter with a frequency response

$$Hd\left(e^{jw}\right)=1 \text{ for } -\pi/3 \le w\pi/3$$
$$= 0 \text{ elsewhere}$$

Use Fourier series method for the design choosing N = 11. (10)

b) Obtain the direct form, cascade form and lattice structure realization of the FIR systems given by $H(z)=1+2z^{-1}+3z^{-2}+4z^{-3}+3z^{-4}+2z^{-5}+z^{-6}$. (10)

VII a) (i) Write short notes on prewarping. (5)

(ii) Compare FIR and IIR filters. (5)

b) Obtain the direct form I, direct form II, cascade and parallel form realization for the following system.

$$y(n)=-0.1y(n-1)+0.2\ y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2).$$ (10)

OR

VIII a) Using the bilinear transform, design a high pass filter, monotonic in pass band with cut off frequency of 1000 Hz and down 10dB at 350 Hz. The sampling frequency is 5000 Hz. (10)

b) Design a chebyshev low pass filter with the following specifications.

$\alpha p=1dB$ ripple in the pass band $0 \le w \le 0.2\pi$ $\alpha_s=15dB$ in the stop band $0.3\pi \le w \le \pi$ using Impulse invariance. (10)

IX a) Draw and explain the architecture of typical DSP Processor. (10)

b) Explain any two applications of DSP. (10)

OR

X a) (i) Write short notes on product quantization error. (5)

(ii) Write short notes on signal sealing. (5)

b) With an example explain limit cycle oscillations. (10)

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