Code No: RR411201 **Set No.1**

IV B.Tech. I Semester Regular Examinations, November -2005
LANGUAGE PROCESSORS
(Information Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What is the role of lexical analyzer. [6]
   (b) Construct an NFA for the regular expression R=(a+b)* abb convert it in to an equivalent DFA. [10]

2. (a) The grammar S → aSa|aa generates all even length strings of a's except for the empty string-show that the brute force method of top down parsing succeeds of 2,4 and 8a's but fails on 6a's. Also find out what are the even strings that are passed by the technique. [8]
   (b) What is an LL(1) grammar. Can you convert every context free grammar into LL(1). [8]

3. (a) Suppose the declaration are generated by the following grammer
   D→idL
   L→,idL/:T
   T→integer/real
   Construct a translation scheme to enter the type of each identifier into the symbol table.
   (b) Explain the translator process using the following example id, id: real. [8+8]

4. (a) Discuss about the overloading of functions and operators with an examples. [10]
   (b) Write a notes on polymorphic functions. [6]

5. (a) Write a notes on the static storage allocation strategy with examples and discuss its limitations. [8]
   (b) Discuss about the static allocation strategy of run-time environment with examples. [8]

6. (a) What are the various machine dependent code optimization techniques. [8]
   (b) Convert the following arithmetic expression into syntax tree and three address code
   b* 3 (a+b) [8]

7. What is a flow graph. Explain how a given program can be converted into a flow graph. [16]

8. (a) How are constants defined in an assembly program? Explain with an example. [8]

(b) What is meant by Assembler directives? Explain the functions of the following assembler directives. [8]

i. START
ii. ORIGIN
iii. EQU
iv. LTORG

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1. (a) Write a procedure that combines two NFAs in to a single NFA. The operations to be performed are those of concatenation, union and closure. [10]
   (b) Write a procedure that detects all extraneous states in a DFA. [6]

2. (a) Explain the reasons for separating lexial analysis phase from syntax analysis. [6]
   (b) Eliminate ambiguities from the following grammar
   S → iEtSeS|iEtS|a
   E → b|c|d [10]

3. (a) Define LR(0) grammer. [4]
   (b) Construct SLR passing table for the following grammar. [12]
   E → E + T/T
   T → TF/F
   F → F*|a|b.

4. (a) What are the advantages and disadvantages of Structural equivalence. Explain with example. [8]
   (b) What are the advantages and disadvantages of Name equivalence. Explain with examples. [8]

5. (a) Write detailed notes on the symbol table mechanism using tree data structure. [8]
   (b) Explain with an example about the symbol table mechanism using hash table data structures. [8]

6. (a) Give a translator grammar for converting boolean expression into three address code. [8]
   (b) Apply the translation scheme on the following expression a< b or c< d and e< f. [8]

7. (a) Consider the following code sequence.
      i. MOV B, R0
      ADD C, R0
      MOV R0 A

ii. MOV B,A
ADD C, A
Calculate the cost of the above instructions in terms of access time and memory usage. [10]

(b) Explain the simple Strategy to generate assembly code from Quadruples. [6]

8. (a) Differentiate single pass and two pass translation of an assembler. [8]

(b) Explain Macro expansion ans Lexical expansion. [8]

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Code No: RR411201 **Set No.3**

IV B.Tech. I Semester Regular Examinations, November -2005
LANGUAGE PROCESSORS
(Information Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Write about lexical analyzer generator. [7]
   (b) Construct minimumstate DFAs for the following regular expressions.
      i. (a+b)* a (a+b) [3]
      ii. (a+b)* a (a+b) (a+b) [3]
      iii. (a/b)* a (a/b)(a/b)(a/b). [3]
2. (a) Construct operator precendence parser for the following grammar for reference expressions.
   $R \rightarrow R`1'R|RR|R^*|(R)|a|b.$ [10]
   (b) What are the common conflicts that can be encountered in shift reduce parsers. [6]
3. (a) What are L-attributed grammars.
   (b) Explain the steps involved in converting an L-attributed grammar into translator scheme. [6+10]
4. (a) What are the advantages and disadvantages of Structural equivalence. Explain with example. [8]
   (b) What are the advantages and disadvantages of Name equivalence. Explain with examples. [8]
5. (a) Explain how the symbol table space can be reused. Explain through an example. [8]
   (b) Discuss various symbol table organization techniques. [8]
6. (a) What are loop invariant components. Explain how they effect the efficiency of a program. [8]
   (b) Compare various forms of three address code. [8]
7. (a) Discuss global optimization techniques. [8]
   (b) Explain the equation for computing live variables in a given flow graph. [8]
8. Design the algorithm for the PASS II of an assembler. Explain the Data structure used in PASS II [16]

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Code No: RR411201 **Set No.4**

IV B.Tech. I Semester Regular Examinations, November -2005
LANGUAGE PROCESSORS
(Information Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Write about lexical analyzer generator. [7]
   (b) Construct minimumstate DFAs for the following regular expressions.
      i. (a+b)* a (a+b) [3]
      ii. (a+b)* a (a+b) (a+b) [3]
      iii. (a/b)* a (a/b)(a/b)(a/b). [3]
2. (a) Convert the following grammar into LL(1) grammar
   R → R"|′R|RR|R ∗ |(R)|a|b [10]
   (b) What are the advantages and disadvantages of operator precedence parsing. [6]
3. (a) What are L-attributed grammars.
   (b) Explain the steps involved in converting an L-attributed grammar into translator scheme. [6+10]
4. (a) What are the advantages and disadvantages of Structural equivalence. Explain with example. [8]
   (b) What are the advantages and disadvantages of Name equivalence. Explain with examples. [8]
5. (a) Write detailed notes on the symbol table mechanism using tree data structure. [8]
   (b) Explain with an example about the symbol table mechanism using hash table data structures. [8]
6. (a) What are loop invariant components. Explain how they effect the efficiency of a program. [8]
   (b) Compare various forms of three address code. [8]
7. (a) What is a flow graph. Explain how flow graph can be constructed for a given program. [10]
   (b) Compare the various forms of three address code. [6]
8. Develop program specifications for the passes of a two pass assembler indicating

(a) Tables for internal use of the passes. [4]

(b) Tables to be shared between passes. [4]

(c) Inputs (Files and Tables) for every pass. [4]

(d) Outputs (Files and Tables) of every pass. [4]

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