Code No: RR320504 **Set No. 1**

III B.Tech II Semester Regular Examinations, Apr/May 2007
LANGUAGE PROCESSORS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Draw a state diagram for a finite automaton to recognize a token type named 'real constant' This token consists of a string of digits that contains a decimal point.There must be at least one digit before the decimal point. [6]
   (b) Select a high- level programming language with which you are familiar and write code to recognize the above construct. [5]
   (c) What kinds of source program errors would be detected during lexical analysis? [5]
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) Explain in detail how an L-attributed grammer can be converted into a translator scheme.
   (b) Give the translate scheme to convert an expression grammer into three address code. [8+8]
4. Write type expression for the following types
   (a) An array of pointers to real, where the array
   index ranges from 1 to 100. [5]
   (b) A two dimensional array of integers (i.e an array of arrays)
   whose rows are indexed from 0 to 9 and whose columns
   are indexed from-10 to 10. [5]
   (c) Functions whose domains are functions from integers to pointers to integers and whose ranges are records consisting of an integer and a character. [6]
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) Explain with an example the abstract machine code form of Intermediate code. [8]
   (b) Give a detailed account on loop optimisation techniques. [8]

7. (a) What are the application of du-and ud. [8]
   (b) Compare the various forms of three address code. [8]
8. (a) Write the features of Assembly Language programming. [6]
   (b) Write the general format of an Assembly language statement. [5]
   (c) Explain the 3 kinds of statements of an assembly program. [5]

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Code No: RR320504 **Set No. 2**

III B.Tech II Semester Regular Examinations, Apr/May 2007
LANGUAGE PROCESSORS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) What are the basic functions of language translator. [10]
   (b) Distinguish pass and phase of a compiler. [6]

2. (a) Eliminate ambiguity if any from the following grammar for boolean expressions.
   bexpr → bexpr or bterm|bterm
   bterm → bterm and bfactor|bfactor
   bfactor → nst factor|(bexpr)|true|false.
   Where or, and, not (,), true, false are terminals in the grammar. [8]
   (b) Write a recursion discent parser for the above grammar. [8]

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) Which of the following recursive type expressions are equivalent ? Justify your answer?
   e1 = integer → e1 e2 = integer →(integer → e2) e3 = integer →(integer → e1). [8]
   (b) Suppose that the type of each identifier is a sub range of integers for expressions with the operators +, -,* , div and mod as in pascal. Write type? checking rules that assign to each sub expression, the sub range its value must lie in. [8]

5. (a) What are self-organizing lists. How this can be used to organize a symbol table. Explain with an example. [8]
   (b) Explain the process of organizing a symbol table for a block structured language. [8]

6. (a) Explain with an example the abstract machine code form of Intermediate code. [8]
   (b) Give a detailed account on loop optimisation techniques. [8]

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

8. (a) Explain how lexical substitution is performed for model statements by a macro preprocessor. [6]

(b) Differentiate Positional and keyword parameter. [5]

(c) How the value of the positional and keyword parameter is determined? Explain with an example. [5]

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Code No: RR320504 **Set No. 3**

III B.Tech II Semester Regular Examinations, Apr/May 2007
LANGUAGE PROCESSORS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Write a procedure for minimizing number of states of a DFA, and explain with one example. [10]
   (b) What are the different translation rules of a LEX program? [6]
2. (a) The grammar S → aSa|aa generates all even length string of a's except for the empty string. If a brute force method of top down parsor is used, it succeeds of 2a's, 4a's, 8a's but fails on 6a's. Find out all even strings for which the parser succeeds. [8]
   (b) List out the rules for constructing the simple precedence table for a CFG. [8]
3. (a) Explain in detail how an L-attributed grammer can be converted into a translator scheme.
   (b) Give the translate scheme to convert an expression grammer into three address code. [8+8]
4. (a) What is a type checker ? How does it work ? [8]
   (b) Write a short notes on static and dynamic type checking. [8]
5. (a) Which data structure will be used to implement a symbol table in an efficient way? Give reasons. [8]
   (b) Discuss and analyze about all the allocation strategies in run-time storage environment . [8]
6. (a) Explain with an example the abstract machine code form of Intermediate code. [8]
   (b) Give a detailed account on loop optimisation techniques. [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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Code No: RR320504 **Set No. 4**

III B.Tech II Semester Regular Examinations, Apr/May 2007
LANGUAGE PROCESSORS
(Computer Science & Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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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) The grammar S → aSa|aa generates all even length string of a's except for the empty string. If a brute force method of top down parsor is used, it succeeds of 2a's, 4a's, 8a's but fails on 6a's. Find out all even strings for which the parser succeeds. [8]
   (b) List out the rules for constructing the simple precedence table for a CFG. [8]

3. Construct LALR parse table for the following grammer
   S → L = R
   S → R
   L → ∗R [16]
   L → id
   R → L

4. (a) What is type expression? Write type expression for the following types. [2]
      i. A two dimensional array of integers (i.e. an array of arrays) whose rows are indexed from 0 to 9 and whose columns are indexed from -10 to 10. [3]
      ii. Functions whose domains are functions from integers to pointers to integers and whose ranges are records consisting of an integer and a character. [3]
   (b) What is type system. Discuss static and dynamic checking of types. [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) Explain with an example the abstract machine code form of Intermediate code. [8]
   (b) Give a detailed account on loop optimisation techniques. [8]

7. (a) What are the application of du-and ud. [8]
   (b) Compare the various forms of three address code. [8]

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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