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

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 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 constructing a deterministic finite automata from a non-deterministic Automata, explain with one example. [10]
   (b) Give the general format of a LEX program. [6]
2. (a) Eliminate ambiguities in the following grammar.
   S → iEtS|iEtSeS|a
   E → b|c|d where a,b,c,d,e,i,t are trminals. [8]
   (b) Construct operator precedence parse table for the above grammer. [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) Write a note on the specification of a Simple type checker. [8]
   (b) Explain the equivalence of type expressions with appropriate examples. [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) What are the applications of DAG. Explain how the following expression can be converted in a DAG
   a+b*(a+b)+c+d [8]
   (b) Explain how loop invariant components can be eliminated. [8]
7. (a) Discuss the various forms of object code. [8]
   (b) Explain how the nature of the object code is highly dependent on the machine and the operating system. [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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Code No: RR320504 **Set No. 2**

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 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) Explain lexical analysis in detail. [8]
   (b) What are the reasons for separating lexical analysis from syntax analysis. [8]

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

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) 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 any two machine dependent code optimization techniques. [8]
   (b) What is a DAG. Explain its application. [8]

7. (a) What are dataflow equations. [8]
   (b) Explain how copy propagation can be done using dataflow equation. [8]

8. (a) Explain the memory requirement for variant I and variant II of intermediate code of an assembler design. [8]

   (b) How Declarative state and Assembler directives are processed by an assembler. [8]

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

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 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 block diagram of phases of a compiler and indicate the main functions of each phase. [10]
   (b) Write the main difference between compiler and interpreter. [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) Construct SLR parse table for the following grammar
   S → Aa|bAc|dc|bda
   A → d.
   (b) Distinguish SLR, LALR grammar. [10+6]
4. (a) Discuss about the overloading of functions and operators with an examples. [10]
   (b) Write a notes on polymorphic functions. [6]
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 any two machine dependent code optimization techniques. [8]
   (b) What is a DAG. Explain its application. [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) Define the following
   i. Macro [2]
   ii. Macro expansion [2]
   iii. Lexical Expansion [2]
   iv. Semantic Expansion [2]

   (b) What is meant by Macro definition? Explain the data structures used in a Macro Processor. [8]

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Code No: RR320504 **Set No. 4**

III B.Tech II Semester Supplimentary Examinations, Aug/Sep 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) 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) List out some typical semantic errors . Explain how they can be rectified? [8]
   (b) What is static checking ? Give some examples of static checks. [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. (a) Define Address Descriptor and Register Descriptor. [4]
   (b) Why Next-use information is required for generating Object code? [6]
   (c) What are the various object code forms. [6]
8. Write a macro which takes A, B, C and D as parameters and calculates A * B + C * D in any register.
   (a) Where would you store the temporary result? [4]

(b) Would you reserve space for the temporary results within the macro body or outside it (i.e. in the main program) Why ? What are the advantages and disadvantages of these alternatives. [12]

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