Code No: R31051 **R10** **Set No: 1**

III B.Tech. I Semester Supplementary Examinations, May - 2013
COMPILER DESIGN
(Computer Science and Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions
All Questions carry equal marks
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1. a) Explain, in detail, lexical analyzer generator.
   b) Write short notes on input buffering.

2. a)What is LEX? Explain, in detail, different sections of LEX program
   b) Explain the role of lexical analyzer

3. a) Explain FIRST and FOLLOW Rules
   b) Construct recursive descent parser for the following grammar
   E→TE$^{|}$
   E′→+TE$^{|}$ | €
   T→FT$^{|}$
   T′→* FT$^{|}$ | €
   F→ (E) | id

4. a) Explain the differences between top down and bottom up parsing
   b) What are the kernel and non kernel items? Obtain the kernel items of the LR(0) parser for the following grammar
   A→A′
   A′→aA′ | b

5. a) Explain the difference between SLR(1) and LALR(1)
   b) Show that the following grammar
   S→Aa | bAc | dc | bda
   A→d
   is LALR(1) but not SLR(1)

6. Explain in-detail, the Syntax Directed Translation Schemes.

7. a)Write the quadruple, triple, indirect triple for the statement
   a:=b*-c+b*-c.
   b) construct the triples of expression : a*-(b+c)

8. Explain in detail machine dependent code optimization techniques
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Code No: R31051 **R10** **Set No: 2**

III B.Tech. I Semester Supplementary Examinations, May - 2013

COMPILER DESIGN

(Computer Science and Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. Describe the output for the various phases of compiler with respect to the following statement

   position=initial+rate*60

2. a) What is a LEX program? Write a LEX program to recognize the decimal numbers
   b) Explain the reserved words and identifiers

3. a) Write the algorithm for Constructing the predictive Parser.
   b) Show that the following grammar is LL(1)

   S→aAB | bA | €
   A→aAb | €
   B→bB | €

4. a) Define LR(K) parser. Draw and explain model of LR parser
   b) Write LR parsing algorithm

5. Construct a DFA whose states are the canonical collection of LR(1) items for the following augmented grammar

   S→A
   A→BA | €
   B→aB | b

6. a) What is ordered and unordered symbol table? What is the function of symbol table in the compilation process? Explain.
   b) Write detailed notes on symbol table mechanism using tree data structure

7. (a) Explain machine independent code optimization.
   (b) Construct a DAG for the following basic block;
   t1 = t2 * t3; t2 = t6+4; t3 = t4 – e; t4 = t5 * t8; t5 = t6 – C; t6 = a + b; t8 = d+e;

8. Explain the following
   (i) Peephole optimization
   (ii) Inter procedural optimization
   (iii) Garbage collection via reference counting

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Code No: R31051 **R10** **Set No: 3**

III B.Tech. I Semester Supplementary Examinations, May - 2013

COMPILER DESIGN

(Computer Science and Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. a) Explain different phases of compiler
   b) Explain differences between the compiler and interpreter

2. a) What is a regular expressions? Write a regular expression for identifier: keyword and design a transition diagram for it
   b) Explain the following terms with example
      i) token
      ii) pattern
      iii) lexeme

3. a) Explain in detail the difficulties in top down parsing
   b) Find FIRST & FOLLOW from the following grammar
      S→aAB | bA | €
      A→aAb | €
      B→bB | €

4. a) Explain the differences between LR and LL parsing
   b) Consider the following grammar
      S→TL;
      T→int | float;
      L→L,id | id
   parse the input string: int id,id; using SLR Parse.

5. a) Explain in detail, the LALR parsing method.
   b) Show that the following grammar
      S→Aa | bAc | Bc | bBa
      A→d
      B→d
   is LR(1) but not LALR(1)

6. a) Explain Directed Acyclic Graph (DAG) for expressions.
   b) Draw the syntax tree and DAG for the expression (a*b)+(c-d)*(a*b)+b

7. what is a loop optimization? Explain various techniques in loop optimization.

8. State and explain different machine dependent code optimization techniques

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Code No: R31051 **R10** **Set No: 4**

III B.Tech. I Semester Supplementary Examinations, May - 2013

COMPILER DESIGN

(Computer Science and Engineering)

Time: 3 Hours **Max Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

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1. a) Explain the structure of a compiler
   b) Consider the following fragment of 'c' code
   float i, j;
   i= i*70+j+2;
   Write the output at all phases of a compiler
2. a) Explain different translation rules of a LEX program
   b) Define lexme, token and pattern. Identify the lexeme that make up the tokens in the following program segment .Indicate the corresponding token and pattern

```
void swap( int i,int j)
{       int t;
        t = i;
        i = j;
        j = t;
        }
```

3. a) What is left recursion? Eliminate left recursion from the following grammar.
   A→Ba | Aa | c
   B→Bb | Ab | d
   b) Explain error recovery strategies in predictive parsing?

4. a) Explain the stack implementation of shift reduce parsing method with an example.
   b) Built SLR(1) parsing table for the following grammar
   E→E+T | T
   T→TF | F
   F→F* | a | b

5. a) What is ambiguous grammar? Eliminate ambiguities for the grammar
   E→E+E | E*E | id
   b) Explain error recovery in LR parsing

6. Explain the following in detailed
   (i) S- attributed definitions (ii) L- attributed definitions (iii) Dependency graph

7. (a) Design an abstract tree for the expression.
   A = (a[i+1] = 2) + a[j]
   (b) Explain in detail, the procedure in timing.

8. a) What is code optimization? What are its advantages?
   b) What are the problems in optimizing compiler design?

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