

FACULTY OF ENGINEERING**B.E. 4/4 (CSE) I – Semester (Main) Examination, November/December 2012****Subject: Compiler Construction****Time: 3 Hours****Max.Marks : 75****Note: Answer all questions from Part – A. Answer any five questions from Part – B.****PART – A (25 Marks)**

1. What is Boot strapping? (2)
2. Differentiate between compiler and interpreter. (3)
3. What is left recursion? Eliminate left recursion for the given expression (3)

$$A \rightarrow Aa|Ab|c|d$$
4. Show that the grammar is ambiguous $S \rightarrow aSbS|bSaS|E$ (Epsclon) (3)
5. Write syntax tree for an expression $a * - (b+c)$ (3)
6. What are the parameter passing mechanisms in a programming language? (2)
7. Write the indirect triple for the expression $X := -a*b + -a*b$ (3)
8. State the rules to define loader in basic block. (2)
9. Define induction variable. (2)
10. What is relocation? (2)

PART – B (5x10 = 50 Marks)

11. Show the translation process of compiler for the given expression (10)

$$\text{Success} := \text{effort} + \text{IQ} * 100.$$
- 12.(a) Check whether the following grammar is LL(1) or not (6)

$$S \rightarrow iEtS | iEtSeS|a$$

$$E \rightarrow b$$
 (b) What is ambiguous grammar give example? (4)
- 13.(a) Differentiate between static run time environment and stack based run time environment. (5)
 (b) Discuss symbol table organization. (5)
14. Main ()

```

{
  int a[10], i,
  For (i = 0; i < 10; i++)
    a[i] = i*2;
}

```

 Convert above program into 3-address code and apply all optimization techniques on that code. (10)
15. Describe data flow analysis in detail. (10)
16. Discuss the design issues of absolute loader. (10)
17. Write short notes on:
 - (a) Heap allocations (5)
 - (b) Recursive Descent parsers. (5)

FACULTY OF ENGINEERING**B.E. 3/4 (CSE) II – Semester (Main) Examination, April / May 2013****Subject: Compiler Construction****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (25 Marks)**

1. Differentiate between pass and phase. (2)
2. Describe the data structures associated with compiler. (3)
3. Define CFG. Write CFG to recognize palindrome. (3)
4. What is left factoring give example? (3)
5. Write about the fields of activation record. (3)
6. Define S-attributed and L-attributed grammars. (2)
7. Specify applications of SDT. (2)
8. Write about value-number method. (2)
9. Construct DAG for the expression $a + a * (b-c) + (b-c) * d$. (3)
10. What is basic block? (2)

PART – B (5x10 = 50 Marks)

- 11.(a) Explain various phases of compiler with neat diagram. (8)
(b) What is boot strapping? (2)
- 12.(a) Write an algorithm to construct first and follow set. (4)
(b) Construct the predictive parse table for the following grammar and show the moves made by the parser on input $i*i\$$.

$$E \rightarrow TE'$$

$$E' \rightarrow + T\epsilon' / \epsilon$$

$$T \rightarrow FT'$$

$$T \rightarrow *FT'/\epsilon$$

$$E \rightarrow (E) / i$$
(6)
- 13.(a) Explain the data structures used for symbol table implementation. (5)
(b) Write about syntax directed definitions. (5)
14. Explain machine dependent and machine independent optimizations in detail. (10)
- 15.(a) Explain heap management. (5)
(b) Explain various representations of three address code of an expression

$$X = -a*b + -a*b$$
(5)
- 16.(a) Explain shift reduce parser. (5)
(b) What is flow graph? Explain live variable analysis. (5)
17. Write short notes on:
a) Lexical analyzer generator lex. (5)
b) Syntax error handling. (5)

FACULTY OF ENGINEERING**B.E. 3/4 (CSE) II – Semester (Main) Examination, June 2014****Subject : Compiler Construction****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 What is cross compiler? Why is bootstrapping required to generate cross compilers? 2
- 2 Write short notes on input buffering. 2
- 3 Find first and follow set for the following grammar. 3

$$S \rightarrow aBDh$$

$$B \rightarrow cC$$

$$C \rightarrow bC|\epsilon$$

$$D \rightarrow EF$$

$$E \rightarrow g|\epsilon$$

$$F \rightarrow f|\epsilon$$
- 4 Why SLR and LALR are more economical to construct than canonical LR? 2
- 5 What is SDD? What are the applications of syntax directed translation? 3
- 6 Describe static scope and dynamic scope. 2
- 7 Briefly explain type conversion and coercion. 3
- 8 List out the various types of three address statements represent the following statement in to triple representation 3

$$X[i] := y;$$
- 9 Construct the DAG for the following statement 3

$$x = y * z$$

$$w = p + y$$

$$y = y * z$$

$$p = w - x$$
- 10 State the major properties of dataflow analysis. 2

PART – B (50 Marks)

- 11 a) Explain the translation phases of a compiler for the given expression. 6
 $P = i + r * 60$
 b) Write short notes on LEX tool. 4
- 12 Construct CLR parsing table for the below grammar. 10
 $S \rightarrow AA$
 $A \rightarrow Aa|b$
- 13 a) What are synthesized attributes and inherited attributes explain with suitable context free grammar. 5
 b) Explain data structures for implementing symbol table. 5
- 14 a) Consider the following piece of code for searching an element x in an array A[100] 5

```

begin
    location = -1
    i = 0
    while (i < 100) do
        begin
            if A[i] = x then location = i
            i = i + 1
        end
    end
end

```

 b) Discuss about garbage collection in detail. 5
- 15 a) Explain code optimization techniques. 5
 b) Explain issues in the code generation. 5
- 16 Explain how to compute data flow equations using live variable analysis by considering any flow graph. 10
- 17 Write short notes on the following :
 a) Explain problems in top-down parsing. 4
 b) Error recovery techniques in various phases 3
 c) Discuss using diagram "Displays" 3
