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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fifth Semester, B.E. – Information Science and Engineering

Semester End Examination; Dec. - 2014

Compiler Design

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.*

PART -A

1. a. With a neat diagram explain the different phases of complier. 10

   b. With block diagram explain language processing system. 6

   c. What are different technologies used in optimizing the computer architecture. 4

2 a. Write transition diagram for:
   (i) relop (ii) Unsigned number. 8

   b. What is the use of sentinels? 2

   c. Explain: (i) Handle pruning (ii) input buffering. 10

3. a. Write an algorithm to eliminate left recursion? And eliminate left recursion for the following grammar.

   $S \rightarrow aABbcD / \hat{I}$
   $A \rightarrow ASd / \hat{I}$
   $B \rightarrow Sac / hC / \hat{I}$
   $C \rightarrow Sf / Cg$
   $D \rightarrow aBD / \hat{I}$ 8

   b. Compute first and follow for the above grammar. 8

   c. For Q 3(b) parse the input string ahfbf. 4

4 a. What are 2 types of conflicts that occur during shift reduce parsing? Give example. 4

   b. Construct LR (1) items for the following grammar $S \rightarrow CC$ $C \rightarrow aC$ $C \rightarrow d$ 10

   c. Construct LR(1) Parsing table for the grammar given in question 4(b) and Parse the string "aadd", 6

PART - B

5 a. What are SDDs and SDTs schemes? With suitable examples explain synthesized and inherited attributes. 10

   b. Give SDD's and SDT's for parser stack implementation of desk calculator. Assume grammar with + and * operations. Write the annotated. Parse tree for input 3 + 4 * sn. 10

6 a. Briefly explain the different types of intermediate codes with examples. 6

   b. List and explain the different issues in the design of a code generator. 8

Contd...2

c. Generate intermediate code and identify the basic blocks for the given source code. 6

```
For i from 1 to 10 do
for j from 1 to 10 do
a[ i , j] = 0.0;
for i from 1 to 10 do
a[i, j] = 1.0
```

7 a. Explain the issues involved in the design of code Generator. 10

b. Explain:

(i) DAG representation of Basic Block 10

(ii) Next – Use information.

8 a. Explain the following code optimization with example:

(i) Finding Local common sub expressions 10

(ii) Dead code Elimination.

b. Explain peephole optimization in detail. 6

c. Define flow graph. How it is constructed? 4

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