

2011**4th SEMESTER EXAMINATION****MCA****COMPILER CONSTRUCTIONS****PAPER—CS/MCA/2403***Full Marks : 70**Time : 3 Hours**The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.**Answer Q. No: 1 and any four from the rest.*

1. Answer any seven questions: 7×2
- (a) What is the role of lexical analyzer?
 - (b) What is symbol table?
 - (c) Differentiate token, pattern and lexeme.
 - (d) Define parser.
 - (d) Define ambiguous grammar.
 - (f) Define handle.
 - (g) What are the various type of intermediate code representation?

(Turn Over)

- (h) What is flow graph ?
- (i) What is basic block ?
- (j) What is LEX ?

2. Consider the Grammar

$S \rightarrow a B D h$

$B \rightarrow c C$

$C \rightarrow bC / t$

$D \rightarrow E F$

$E \rightarrow g / t$

$F \rightarrow f / t$

(a) Compute FIRST & Follow Set.

(b) Construct predictive parsing table.

(c) Is this grammar LL(1)? Justify. (3+3)+6+2

3. Construct SLR passing table for the following grammar :

$S \rightarrow xAy / xBy / xAz$

$A \rightarrow aS / q$

$B \rightarrow q$

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4. Design LALR parsing table for the following grammar :

$S \rightarrow Aa / aAc / Bc / bBa$

$A \rightarrow d$

$B \rightarrow d$

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5. (a) Write syntax directed definition for the following grammar : 7

$D \rightarrow id L$
 $L \rightarrow , id L / : T$
 $T \rightarrow integer / real$

- (b) Consider the following sequence of statement

$x = y * z$
 $w = p + y$
 $y = y * z$
 $p = w - x$

- (i) Construct the corresponding DAG. 3
(ii) Perform code generation assuming two registers are available. 2
(iii) Perform code generation assuming one register is available. 2

6. (a) Consider the following three address code

1. $RPOD := 0$
2. $I := 1$
3. $T_1 := 4 * I$
4. $T_2 := add(A) - 4$
5. $T_3 := add(B) - 4$
6. $T_5 := T_4 [T_1]$
7. $T_6 := T_3 * T_5$
8. $PROD := PROD + T_6$
9. $I := I + 1$
10. if $i < 20$ go to (3)

Find the basic blocks and flow graph. 7

(b) Consider the grammar G :

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$S \rightarrow A$

$A \rightarrow B / BaA$

$B \rightarrow bC$

$C \rightarrow Cb / Ce / \epsilon$

(i) Grammar G is not LR(0) ? Why ?

(ii) Is grammar G SLR(1) or not ? Why ?

7. Write short notes on (any two) :

7×2

(a) Phases Compiler ;

(b) Conversion of NFA to DFA ;

(c) Chomsky Hierarchy of Grammars. ;

(d) Bootstrapping a compiler.
