

Registration No. :

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Total number of printed pages – 3

B. Tech
PCCS 4305

Sixth Semester Examination – 2013

COMPILER DESIGN

BRANCH : CSE

QUESTION CODE : A 192

Full Marks – 70

Time : 3 Hours

*Answer Question No. 1 which is compulsory and any **five** from the rest.
The figures in the right-hand margin indicate marks.*

1. Answer the following questions :

2×10

- (a) What is shift reduce conflict ?
- (b) What do you mean by cross compiler ?
- (c) Why LR parsing is attractive one ?
- (d) What is the role of LEX and YACC ?
- (e) What are various code optimization techniques ?
- (f) What are induction variables ? Give an example.
- (g) Comment on "Every S-attributed definition is L-attributed".
- (h) Explain why an ambiguous grammar cannot be LL(1).
- (i) What are various data structures used in a symbol table ?
- (j) Define handle. What do you mean by handle pruning ?



2. (a) Explain, in detail, the various phases of compiler. Describe the output for the following expression after each phase 5

$a := b + c * 50$

P.T.O.

(b) Draw a NFA for the regular expression 5

$(c | d)^* c d d$

Hence find its equivalent DFA.

3. (a) Eliminate Left Recursion from the following grammar 5

$S \rightarrow a | \uparrow | (T)$

$T \rightarrow T, S | S$

Draw the predictive parse table. Is the parser LL(1)? Show the actions of the parser for the input string (a,a).

(b) Consider the following grammar : 5

$S \rightarrow (L) | a$

$L \rightarrow L, S | S$

Construct the leftmost derivations and parse trees for the following sentences :

(i) $(a, (a, a))$

(ii) $(a, ((a, a), (a, a)))$

4. Construct the LALR parsing table for the following grammar : 10

$S \rightarrow Aa$

$S \rightarrow bAc$

$S \rightarrow dc$

$S \rightarrow bda$

$A \rightarrow d$

Parse the input string bdc using table generated by you.



5. (a) Write the grammar and the syntax directed translation for desk calculator and show the annotated parse tree for expression $(5+6)*(7+8)$. 5

(b) What is an Activation Record? What is its content? When is it created? Explain with an example. 5

6. (a) What is objective of intermediate code generation ? Write Quadruples, Triples and Indirect Triples for the following expression : 5
- $X[i]:=Y$
 $X:=Y[i]$
- (b) Describe the contents of the symbol table. What information is recorded in the symbol table of a compiler for a block structured language ? Explain with example. 5
7. (a) Explain the goals of an error handler. Describe the various strategies for recovering from a syntax error. 5
- (b) What is a basic block ? Write down an algorithm to construct the set of basic blocks from the given set of quadruples. 5
8. (a) What is peephole optimization ? Explain with an example. 5
- (b) Explain different type of optimization that can be performed in a loop. 5

