Registration No. :						

Total number of printed pages - 3

B. Tech PCCS 4305

2 × 10

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.

- Answer the following questions :
 - (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?
- (a) Explain, in detail, the various phases of compiler. Describe the output for the following expression after each phase

a := b + c*50



(b) Draw a NFA for the regular expression

5

Hence find its equivalent DFA.

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

5

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

$$T \rightarrow T, S \mid S$$

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:

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$$S \rightarrow (L) \mid a$$

$$L \rightarrow L,S \mid S$$

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

- (i) (a,a,a))
- (ii) (a,((a,a),(a,a))

Explain with an example.



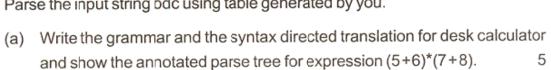
Construct the LALR parsing table for the following grammar: 4.



- $S \rightarrow Aa$
- $S \rightarrow bAc$
- $S \rightarrow dc$
- $S \rightarrow bda$



Parse the input string bdc using table generated by you.



(b) What is an Activation Record? What is its content? When is it created?

5.

- 6. (a) What is objective of intermediate code generation? Write Quadruples, Triples and Indirect Triples for the following expression:
 - 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.
- (a) Explain the goals of an error handler. Describe the various strategies for recovering from a syntax error.
 - (b) What is a basic block? Write down an algorithm to construct the set of basic blocks from the given set of quadruples.
- 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