



(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : **110603**

Roll No.

B. Tech.

(SEM. VI) THEORY EXAMINATION, 2014-15
COMPILER DESIGN

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all Questions.

1 Attempt any four parts of the following. 5×4=20

- (a) Explain all the necessary phases and passes of a compiler design.
- (b) What is a cross compiler ? How is boot-strapping of a compiler done to a second machine ?
- (c) Write short note on :
 - (i) Context free grammar
 - (ii) Yacc parser generator.
- (d) Check whether left recursion exists for the following grammar :

$$S \rightarrow Aa/b$$

$$A \rightarrow Ac/Sd/e$$

- (e) How does finite automata useful for lexical analysis ?
Construct the NFA and DFA for the following regular expression

$$(a+b)^*abb.$$

- (f) Discuss the role of Macros in programming languages.

2 Attempts any two parts of the following : 10×2=20

- (a) Generate three address code for the following code segment :

While (a<b) do

If (c<d) then $x = y + z$

- (b) What is syntax directed translation ? How are semantic actions attached to the production ? Explain with an example.
- (c) What is postfix translation ? Explain it with suitable example.

3 Attempts any two parts of the following : 10×2=20

- (a) Construct the CLR parse table for the following Grammar.

$$S \rightarrow CC$$

$$C \rightarrow cC$$

$$C \rightarrow d$$

- (b) Give algorithm for constructing of predictive parsing table. Consider the following grammar and construct predictive parsing table

$$S \rightarrow iEtSS_1/a$$

$$S_1 \rightarrow eS/E$$

$$E \rightarrow b$$

- (c) Describe various representation of three address codes. Translates the expression :

$$-(a+b)^*(c+d)+(a+b+c)$$

4 Attempts any two parts of the following : 10×2=20

- (a) Discuss the various data structures used for symbol table with suitable example.
- (b) Write short note on
- Scoping
 - Activation record
 - Backpatching
- (c) What do you understand by lexical error and syntactic error ? Also suggest methods for recovery of errors.

5 Attempts any two parts of the following : 10×2=20

- (a) What is DAG ? What are its advantages in context of optimization ?
- (b) What is data flow analysis ? How does it use in code optimization ?
- (c) Explain what constitute a loop in a flow graph and how will you do loop optimizations in code optimization of a compiler.