(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 :

$$S \rightarrow Aa / b$$
$$A \rightarrow Ac / Sd / e$$



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(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 ? Expalin 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.

$$S \rightarrow CC$$
$$C \rightarrow cC$$
$$C \rightarrow d$$



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(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

(i) Scoping

(ii) Activation record

(iii) 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.



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