(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH/M.TECH] MAY-JUNE 2014

Paper Code: IT-308 **Subject: Compiler Design**

Time: 3 Hours **Maximum Marks: 60**

Note: Attempt five questions including Q.no.1 which is compulsory. Select one question from each Unit.

Q1 Attempt all parts:-

(a) Eliminate left recursion from the following grammer and rewrite the Grammer.

$S \longrightarrow Aa/b$

$A \longrightarrow Ac/Sd/\in$ **(2)**

(b) Define linker and loader. **(2)**

(c) How Symbol Table differs from other data structures? **(2)**

(d) Translate the arithmetic expression $a^* - (b + c)$ into three address code. **(2)**

(e) Which translator is better single pass or multi pass and why? **(2)**

(f) Mention types of Chomsky classification of grammers. **(2)**

(g) Explain the problem of left factoring. **(2)**

(h) How CPU registers are allocated while creating machine code? **(2)**

(i) Show annotated parse tree for the sentence **(2)**

Read id_1, id_2, id_3

(j) What is ambiguity? How an ambiguous grammer is converted to unambiguous grammer? **(2)**

Unit-I

Q2 (a) Define various phases of a compiler. **(5)**

(b) Write a regular definition for the language of all strings of 0's and 1's with an even number of 0's and odd number of 1's. **(5)**

Q3 (a) Define following terms: Lex, Lexeme, Lexical analyzed and token. Describe the role of a lexical analyzer. **(5)**

(b) Convert the regular expression $(a + b)^*abb$ into eNFA and then corresponding DFA. **(5)**

Unit-II

Q4 (a) Check whether following grammer is LR(0) grammer or not. **(6)**

$S \longrightarrow L=R$

$S \longrightarrow R$

$L \longrightarrow *R$

$L \longrightarrow id$

$R \longrightarrow L$

(b) Write unambiguous grammer for producing arithmetic expression consisting of symbols id, +, -, /, $. Find first & follow of non terminal symbols of the grammer for non recursive productive parser. **(4)**

Q5 (a) Explain functioning and constituents of a SLR parser. **(3)**

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(b) Consider the following grammer:-

$E \longrightarrow E+T/T$

$T \longrightarrow TF/F$

$F \longrightarrow F*/a/b$

Construct SLR and LALR parsing table for the given grammer. **(7)**

Unit-III

Q6 (a) Explain how type checking and error reporting is performed in a compiler. **(5)**

(b) Explain heap, dynamic storage allocation techniques and synthesized attributes. **(5)**

Q7 (a) Explain activation record. How is task divided between calling and called program for task updating? **(6)**

(b) What are different parameter passing methods? Illustrate call by result, call by name and call by value result through examples. **(4)**

Unit-IV

Q8 (a) Explain peep hole optimization. **(6)**

(b) Draw syntax tree and DAG for following statement:- **(4)**
Write three address codes from both.

$a = (a + b * c) \wedge (b * c) + b * c$

Q9 (a) Explain any three types of optimization techniques. **(6)**

(b) Describe code generator design issues. **(4)**

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