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

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH] MAY-JUNE 2018

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

Time: 3 Hours **Maximum Marks: 75**

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

Q1 Explain following in brief (**any five**):-

(a) What is a scanner? Define token and lexeme. **(5)**

(b) What are the benefits of using machine-independent intermediate forms? List out the primary structure preserving transformations on basic block. **(5)**

(c) Differentiate in between Top-down and bottom up parsing. Illustrate the difference in between LR(0) bad SLR(1) parsing. **(5)**

(d) Define FIRST and Follow sets. Illustrate through an example. **(5)**

(e) What area the valid three address instructions? Define quadruple and triple mechanisms to implement three address codes. **(5)**

(f) What is symbol table? Draw its structure. **(5)**

UNIT-I

Q2 Describe the various phases of complier and trace the program segment A= B+C*60 for all phases. **(12.5)**

Q3 Illustrate Bootstrapping process in the design of a self-hosting complier. Briefly explain the compiler construction tools. **(12.5)**

UNIT-II

Q4 Construct the LALR and SLR(1) Parsing Table for the following Grammar. Why CLR parsers are considered to be powerful than LALR parsers. **(12.5)**

$S \rightarrow Aa|aAc|Bc\ |bBa$

$A \rightarrow d$

$B \rightarrow D$

Q5 What is ambiguous grammar Consider the following grammar and construct the LR(1) parsing table. **(12.5)**

$S \rightarrow aSbS|bSaS|\in$

UNIT-III

Q6 Define S and L attribute grammar. Consider the program fragment: **(12.5)**

$sum = 0$

$for(i = 1; i <= 20; i++)$

$sum = sum + a[i] + b[i];$

and generate the three-address code for it. There are four bytes per word.

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IT-308

P. 1/2

Q7 Discuss run time environment (static, stack based and dynamic) in detail. What are the different fields of an activation record? Illustrate through an example. **(12.5)**

UNIT-IV

Q8 List the major issues and challenges involved in the design of a code generator. Construct the DAG for the following basic block. **(12.5)**

$d := b * x$

$e := a + b$

$b := b * c$

$a := e - d$

Q9 Write short comments on **any two** of the following:- **(12.5)**

(a) Peephole optimization

(b) Bison and Flex

(c) IN and OUT sets in the global data flow analysis

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