Reg. No.									

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MANIPAL INSTITUTE OF TECHNOLOGY

(Constituent Institute of MANIPAL University)

MANIPAL-576104

SIXTH SEMESTER B.E. (CS&E) DEGREE EXAMINATION makeup

Subject: LANGUAGE PROCESSORS **Code: CSE- 302**

DATE: **TIME: 3 HOUR** **MAX.MARKS: 50**

Instructions to the Candidates

- Answer ANY FIVE full Questions.
- Missing data can be suitably assumed
- Answer should be clear and concise in point form

1A Which phase of a compiler generates Syntax Tree? Draw a Parse Tree and Abstract Syntax Tree for the given C expression: a [i + 1] = a [i] + 2. **4M**

1B Use Thompson's Construction to convert regular expression **(a | b)* a (a | b | ε)** into a NFA and convert NFA into a DFA using subset construction. **6M**

2A Write the CFG for do-while loop and switch case statements in C language **4M**

2B Eliminate left recursion for the following grammar. **6M**

S→A|B|Sc|dS

A→Bd|cA|f

B→Sc|Ad|g

3A Write the Differences between SLR Parser, LALR parser and LR(1) Parser **4M**

3B Show the following grammar is not SLR(1) **6M**

S→Aa | bAc | dc | dba

A→d

4A Consider the following grammar for variable declarations in a C language **4M**

Decl → Type Varlist

Type→**int** | **float**

Varlist→i**d,** Varlist |**id**

Write semantic rules for expressing how the data type attribute is related to the type of the declaration.

4B For the following Three-Address code : **6M**

I. Construct the Flow graph by identifying basic blocks.
II. Construct the DAG for the basic block where Optimisation needs to be done.

```
read x
t=x>0
if_false t1 goto L1
fact=1
label L2
t2=fact*x
fact=t2
t3=x-1
x=t3
t4=x= =0
if-false t4 goto L2
write fact
label L1
halt
```

5A Illustrate the use of the Data Structures and tasks performed by the Analysis and Synthesis phase in Assembly Scheme. **4M**

5B Explain briefly the different ways of implementing three address statements. Translate the expression x=(a+b) * (a-b)+(a+b+c) into 3-address statements and implement them using different implementation techniques. **4M**

5C Construct the LL(1) parsing table for the following grammar and Check whether the following input string is accepted by the grammar or not? **2M**

$S \rightarrow (S)S \mid \varepsilon$

Input string: **( )**

6A What is the principle task of the Compiler? Differentiate the advantages of Static Vs. Dynamic Type Checking. **4M**

6B Explain the operations of Absolute loader. **2M**

6C Define Handle and Handle Pruning **2M**

6D Define Register Descriptor and Address Descriptor **2M**