Reg. No.									

प्रज्ञानं ब्रह्म

Manipal
INSPIRED BY LIFE

MANIPAL INSTITUTE OF TECHNOLOGY

(Constituent Institute of MANIPAL University)

MANIPAL-576104

KNOWLEDGE IS POWER
MANIPAL INSTITUTE OF TECHNOLOGY

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

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 What are the parameters used in "Chomsky Hierarchy" to classify the Languages? Explain briefly about the programs related to compilers. **4M**

1B Use Thompson's Construction to convert regular expression $\mathbf{(\ aa \mid b\ )^{*}\ (\ a \mid bb\ )^{*}}$ into a NFA and convert NFA into a DFA using subset construction. **6M**

2A Check whether the given grammar is an ambiguous or not. Justify your answer . **4M**

S→aB|bA

A→aS|bAA|a

B→bS|aBB|b

2B Construct the LL(1) parsing table for following grammar using FIRST and FOLLOW sets. **6M**

Statement →Ifstmt| ***other***

Ifstmt → ***if (*** *exp* ***)*** *Statement Elsepart*

Elsepart → ***else*** *Statement | ε*

exp → 0 | 1

3A Write the Algorithm for LR(0) Parsing and construct the DFA of LR(0) Items for the given Grammar. **4M**

S→ AaAb |BbBa

A→ε

B→ε

3B Construct LALR(1) Parsing table for the following grammar **6M**

S→CC

C→eC | d

4A Consider the following grammar, where numbers may be octal or decimal, indicated by a one character suffix **o**(for octal) or **d**(for decimal): **4M**

BasedNum → Num Basechar
Basechar → **o** | **d**
Num → Num Digit | Digit
Digit → 0|1|2|3|4|5|6|7|8|9

Write the attribute grammar for **base** and **value.**

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.

```
1) sum = 0
2) i = 0
3) t1 = 4 * i
4) t2 = a[t1]
5) t3 = sum + t2
6) sum = t3
7) t4 = i + 1
8) i =  t4
9) if  i < 10 goto (3)
```

5A Explain the statements in Assembly Language with syntax. **4M**

5B Explain briefly the different *type constructors* used in type expressions **4M**

5C What are the disadvantages of recursive descent parser? **2M**

6A Explain how a Hash Table deals with collision, if it is chosen for Symbol table. **4M**
Show the status of Symbol Table contents after processing the declarations of the body of function **f.**

```
int i, j;
int f ( int size)
{   char i, temp;
  ……
 {  double j;
    …….
  }
  ……
  { char * j;
  ……
   } }
```

6B Define EXTRN and ENTRY statements **2M**

6C Differentiate between **4M**

I. Top down parsing and Bottom up parsing
II. P-Code and Three-Address code