Reg No.									

प्रज्ञानं ब्रह्म

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MANIPAL INSTITUTE OF TECHNOLOGY
(Constituent Institute of Manipal University)
MANIPAL-576104

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MANIPAL INSTITUTE OF TECHNOLOGY

SIXTH SEMESTER B.E. (CSE) DEGREE END SEMESTER EXAMINATION
17-5-2012
LANGUAGE PROCESSORS (CSE 302)

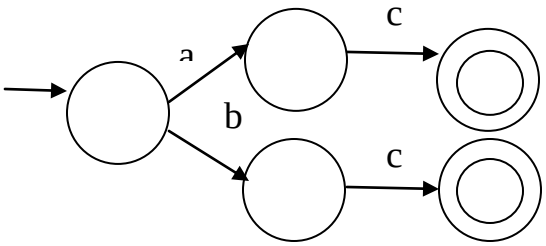
TIME: 3 HOURS MAX.MARKS: 50

Instructions to Candidates
Answer any FIVE FULL questions.

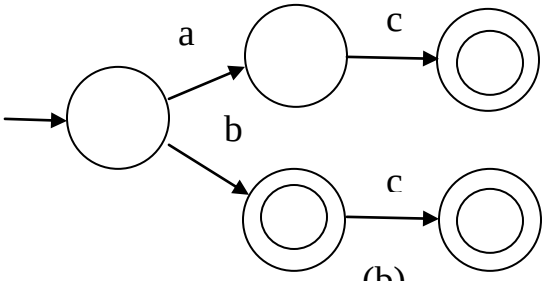
1.(A). Explain the following
i. interpreter
ii. pre-processor
iii. profiler
iv. project manager [2 Marks]

1.(B). List and explain the major data structures in a compiler. [4 Marks]

1.(C). Minimize the state of the following DFAs.



(a)



(b)

[2 + 2 =4 Marks]

2.(A). What is the structure of a token in a typical programming language ? Write a C code to represent it. [2 Marks]

2.(B). Consider the regular expression (aa|b)*(a|b)*

i. Convert the regular expression into a NFA using Thompson's construction. [2 Marks]

ii. Convert the resulting NFA into DFA. [2 Marks]

2.(C) Consider the following grammar

declaration →*type var-list*
type → int | float
var-list →identifier, *var-list* | identifier

i. Left factor the grammar. [1 Mark]
ii. Construct First and Follow sets for non-terminals of the following grammar. [1 Mark]
iii. Construct the LL(1) parsing table for the resulting grammar, if possible. [2 Marks]

3.(A). Consider the Following CFG

Var_decl →var Decl_list
Decl_list →Decl ; Decl_list | Decl
Decl →Id_list : id
Id_list →Id_list , id | id

Transform the given grammar for making it suitable for Top down parsing. [2 Marks]

3.(B). Construct LL(1) Recovery parsing table for all the non-terminal symbols of the new grammar of question 3.(A). [3 Marks]

3.(C). For the following grammar, construct the set of LR(0) states of DFA to recognize viable prefixes of this language. Then fill out an SLR parse table for this grammar and indicate whether the grammar is ambiguous. [3 + 2 Marks]

A →++ AB | id B
B →++ B| ε

Note: ++ is a single token

4.(A). Explain the Disambiguating rules in Bottom-up Parsing. [2 Marks]

4.(B). For the following grammar, construct the set of Items of DFA using LR(1) Parsing with parsing table

S →XX
X →aX | b

[5 Marks]

4.(C). Define the following terms with an example for each

i. Handle
ii. Viable Prefix
iii. Kernel Item
iv. Closure Item [3 Marks]

5. (A)Write an attribute grammar for the floating point value of a decimal number given by the following grammar.

dnum → num.num
num → num digit | digit
digit → 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 [4 Marks]

5. (B). How the set of characters of a symbol is converted into a number representing the hash code of a hash table ? Explain the various issues involved in such a conversion. [4 Marks]

5. (C). List and explain the various optimizations possible in the following code.

```
#include <stdio.h>
#include <math.h>

void main()
{
        int x;
        float val;
        val = pow(x,2)+ x * 2;
}
```

[2 Marks]

6. (A). Write a program in C to find the first n fibonacci numbers. Accept n from the user. Write three address code for the program. [4 Marks]

6. (B). Explain the following with regard to an assembler.

i. two pass assembler
ii. backpatching
iii.Literal table
iv.LC Processing [4 Marks]

6.(C). Briefly explain the process of linking. [2 Marks]

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