Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CSE)/SEM-7/CS-701/2011-12

2011

LANGUAGE PROCESSOR

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternati es for the following : $10 \times 1 = 10$

i) Firstpos of a.(dot node with leaves c1 and c2 is

a) firstpos(c1) $\cup$ firstpos(c2)

b) firstpos(c1) $\cap$ firstpos(c2)

c) if (nullable(c1))

firstpos(c1) $\cup$ firstpos(c2)

else firstpos(c1)

d) if (nullable(c2))

firstpos(c1) $\cup$ firstpos(c2)

else firstpos(c1) .

ii) Parse tree is generated in the phase of

a) Syntax Analysis

b) Semantic Analysis

c) Code Optimization

d) Intermediate Code Generation.

iii) FIRST ($\alpha\beta$) is

a) FIRST (α)

b) FIRST (α) $\cup$ FIRST (β)

c) FIRST (α) $\cup$ FIRST (β) if FIRST (α) contains $\square$ else FIRST (α)

d) none of these

iv) A given grammer is not LL(1) if the parsing table of a grammer may contain

a) any blank field

b) any e-entry

c) duplicate entry of same production

d) more than one production rule.

v) White spaces and tabs are removed in

a) Lexical analysis b) Syntax analysis

c) Semantic analysis d) all of these.

vi) Left factoring guarantees

a) not occurring of backtracking

b) cycle free parse tree

c) error free target code

d) correct LL(1) parsing table.

vii) A parse tree showing the values of attributes at each node is called in particular

a) Syntax tree

b) Annotated parse tree

c) Syntax Direc parse tree

d) Direct Acyclic graph.

viii) Which of the following is not true for Dynamic Type Checking ?

a) It increases the cost of execution

b) Type checking is done during the execution

c) All the type errors are detected

d) None of these.

ix) Which of the following is not a loop optimization ?

a) Induction variable elimination

b) Loop jamming

c) Loop unrolling

d) Loop heading.

x) YACC builds up

a) SLR parsing table

b) LALR parsing table

c) canonical LR parsing table

d) none of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Describe analys s phase of a compiler in respect of the following example.

   Position = initial + rate * 60. 1 + 4

3. Describe with diagram the working process of Lexical Analyzer.

4. What is error handling ? Describe the Panic Mode and Phrase level error recovery technique with example. 1 + 4

5. What do you understand by L-attributed definitions ? Illustrate with an example. 2 + 3

6. What is recursive descent parsing ? Describe the drawbacks of recursive descent parsing for generating the string '*abc*' from the grammar :

$S \varnothing aBc$

$B \varnothing bc \mid b$ 1 + 4

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. Describe with a block diagram the parsing technique of LL(1) parser. Parse the string 'abba' using LL(1) parser where the parsing table is given below :

	a	*b*	$
S	$S \varnothing aBa$		
B	$B \varnothing \varepsilon$	$B \varnothing bB$	

Check whether the following grammer is LL(1) or not.

$S \varnothing i\ C\ t\ SE \mid a$

$E \varnothing e\ S \mid \varepsilon$

$C \varnothing b$. 4 + 4 + 7

8. Describe LR parsing with block diagram. What are the main advantages of LR parsing ? Construct SLR parsing table for the grammer given below :

   $S \varnothing Cb$

   $C \varnothing bC \mid d$. 4 + 3 + 8

9. Construct DFA directly from [Not by generating NFA] the regular expression $L = (a \mid b)^* ab$

   What are the main contributions of Syntax Directed Translation in Compiler ? Design a Dependency Graph and Direct Acyclic Graph for the string :

   $a + a * (b - c) + (b - c) * d$. 7 + 3 + 5

10. a) Translate the expression

   $a = - (a + b) * (c + d + (a + b + c)$ into

   i) Quadruple

   ii) Triple

   iii) Indirect Triple

   iv) 3-address code.

   b) Draw the flow graph for the following code :

   i) location = – 1

   ii) $i = 0$

   iii) $i < 100$ goto 5

   iv) goto 13

   v) $t_1 = 4i$

vi) $t_2 = A [t_1]$

vii) if $t_2 = x$ goto 9

viii) goto 10

ix) location = i

x) $t_3 = i + 1$

xi) $i = t_3$

xii) goto 3

xiii) .....

c) What do you understand by terminal table and literal table ? 8 + 5 + 2

11. Write short notes on any *three* of the following : 3 × 5

a) LEX and YAAC

b) Activation Record

c) Symbol Table

d) Pe phole optimization

e) Input Buffering.