

CD Lab Test Sample Questions

1. Write a C program to identify the single and multiline comments from given input program.
2. Write a C program to recognize strings under – “a*bb+a*“
3. Write a C/C++ program to implement the design of a Lexical analyzer to recognize the tokens and number of tokens defined by the following program.

Program:

```
int main()
{
    int a = 5;
    float 1a = 10;
    return;
}
```

Instructions:

- a) Print list of valid tokens and specify their type (keyword, identifier, operator, parenthesis, etc)
 - b) Print list of invalid tokens
 - c) Print total number of tokens
4. Implement a Lex program to count total number of consonants, vowels and total number of sentences from any given input string.

5. Implement a program to print First Set of given LL1 grammar

Grammar: E -> TR
R -> +TR
R -> ϵ
T -> FY
Y -> *FY
Y -> ϵ
F -> (E)
F -> i

6. Implement a program to print Follow Set of given LL1 grammar

Grammar: E -> TR
R -> +TR
R -> ϵ
T -> FY
Y -> *FY
Y -> ϵ
F -> (E)
F -> i

7. Implement a program to print Parsing table of given LL1 grammar

Grammar: S -> aABb
A -> c | ϵ
B -> d | ϵ

First Set: $\text{First}(S) = \{a\}$, $\text{First}(A) = \{c, \#\}$, $\text{First}(B) = \{d, \#\}$

Follow Set: $\text{Follow}(S) = \{\$\}$, $\text{Follow}(A) = \{d, b\}$, $\text{Follow}(B) = \{b\}$

8. Implement Recursive Descent Parser for the given grammar.

Grammar: $X \rightarrow xY$

$Y \rightarrow ZwY \mid xY \mid \epsilon$

$Z \rightarrow yW$

$W \rightarrow zW \mid \epsilon$

9. Given parsing table for LR (0), write a program to print the stack entries for parsing any given input string.

Grammar: $S \rightarrow (S) \mid id$

	Action				Goto
	()	\$	Id	S
0	S3			S1	2
1	R2	R2	R2	R2	
2			ACC		
3	S3			S1	4
4		S5			
5	R0	R0	R0	R0	

10. Given parsing table for SLR(1), write a program to print the stack entries for parsing any given input string.

Grammar: $P \rightarrow QQ$

$Q \rightarrow pQ \mid q$

	Action			Goto	
	p	q	\$	Q	P
0	S3	S4		2	1
1			ACC		
2	S3	S4		5	
3	S3	S4		6	
4	R3	R3	R3		
5			R1		
6	R2	R2	R2		

11. Given parsing table for CLR(1), write a program to print the stack entries for parsing any given input string.

Grammar: $X \rightarrow ZZ$

$Z \rightarrow xZ \mid y$

	Action			Goto	
	x	y	\$	X	Z
0	S3	S4		1	2

1			ACC		
2	S6	S7			5
3	S3	S4			8
4	R3	R3			
5			R1		
6	S6	S7			9
7			R3		
8	R2	R2			
9			R2		

12. Generate LALR Parser with YACC for following grammar.

Grammar: $E \rightarrow E + T$

$E \rightarrow E - T$

$E \rightarrow T$

$T \rightarrow T * F$

$T \rightarrow T / F$

$T \rightarrow F$

$F \rightarrow (E)$

$F \rightarrow \text{id}$

Note: “id” can be any number

13. Implement a program to print Three Address Code for given expression according to the operator precedence.

Example expression: $x = a + b * c - d$

14. Implement a program to print Target Code for given input expression.

Example expression: $x = a + b, y = c - d, t = x * y$

Note: These are sample programs. The grammar, strings and if any, may change at the time of lab test.