Vivekanand Education Society's Institute of Technology
Department of Computer Engineering

Subject: - SPCC

Class:- S.E. (D12) **Semester:- VI** **Div:- A**

Roll No: 21	Name: Amit Joshi		
Exp. No:	Title: Assignment		
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GRADE:	LAB OUTCOMES :	SIGNATURE:	

1. Problem 1:

$S \rightarrow ACB / CbB / Ba$

$A \rightarrow da / BC$

$B \rightarrow g / \epsilon$

$C \rightarrow h / \epsilon$

First function:-

$first(S) \Rightarrow \{first(A) - \epsilon\} \cup \{first(C) - \epsilon\} \cup \{First(B) \cup First(b) \cup \{first(B)\} \cup first(a)$

$= \{d, g, h, \epsilon, b, a\}.$

$First(A) = first(d) \cup \{first B - \epsilon\} \cup First(C)$

$= \{d, g, h, \epsilon\}$

$first(B) = \{g, \epsilon\}$

$First(C) = \{h, \epsilon\}$

follow functions:-

$follow(S) = \{\$\}$

$follow(A) = \{first(C) - \epsilon\} \cup \{first(B) - \epsilon\} \cup follow(S)$

$= \{h, g, \$\}$

$follow(B) = follow(S) \cup first(a) \cup \{first(C) - \epsilon\} \cup follow(A)$

$= \{\$, a, h, g\}$

$follow(C) = \{first(B) - \epsilon\} \cup follow(S) \cup first(b) \cup follow(A)$

$= \{g, \$, b, h\}$

2. Problem-2

$S \rightarrow AaAb / BbBa$

$A \rightarrow \epsilon$

$B \rightarrow \epsilon$

$first(S) = \{First(A) - \epsilon\} \cup \{First(B) - \epsilon\} \cup first(a) \cup first(b)$

$= \{a, b\}$

$first(A) = \{\epsilon\}$

$First(B) = \{\epsilon\}.$

follow (S) = { $ }
follow (A) = first (a) ∪ first (b)
= { a, b }
follow (B) = first (b) ∪ first (a)
= { a, b }.

3. Problem 3

S → aBDh
B → cC
C → bC | ε
D → EF
E → g | ε
F → f | ε

First (S) = { a }
First (B) = { c }
First (C) = { b, ε }
First (D) = { First (E) − ε } ∪ First (f)
= { g, f, ε }

First (E) = { g, ε }
First (F) = { f, ε }

follow (S) = { $ }
follow (B) = { first (D) − ε } ∪ first (h)
= { g, f, h }
follow (C) = follow (B) = { g, f, h }
follow (D) = first (h) = { h }
follow (F) = { first (F) − ε } ∪ follow (D)
= { f, h }
follow (F) = follow (D) = { h }.

4. Problem 4:

$S \rightarrow (L) / a$

$L \rightarrow SL'$

$L' \rightarrow ,SL' / \varepsilon$

first functions:-

$first(S) = \{(, a\}$

$first(L) = first(S) = \{(, a\}$

$first(L') = \{,, \varepsilon\}$

$follow(S) = \{\$\} \cup \{first(L') - \varepsilon\} \cup follow(L) \cup follow(L')$

$= \{\$, ,,)\}$.

$follow(L) = \{)\}$

$follow(L') = follow(L) = \{)\}$

5. Problem 5

$S \rightarrow A$

$A \rightarrow aB \mid Ad$

$B \rightarrow b$

$C \rightarrow g$.

given grammar is left recursive.

$S \rightarrow A$.

$A \rightarrow aB / A'$

$A' \rightarrow dA' / \varepsilon$

$B \rightarrow b$.

$C \rightarrow g$.

$first(S) = first(A) = \{a\}$

$first(A) = \{a\}$

$first(A') = \{d, \varepsilon\}$

$first(B) = \{b\}$

$first(C) = \{g\}$.

follow (S) = { $ }

follow (A) = follow (S) = { $ }

follow (A') = follow (A) = { $ }

follow (B) = { first (A') − ε } ∪ follow (A) = { d, $ }

follow (C) = NA.