classmate
Date
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CLASS:- B.TECH III, Computer Eng.

SEM:- Semester 6

U18CO081

System Softwares
Tutorial 9

Ans 1:

$S \rightarrow aAb \mid \varepsilon$
$A \rightarrow aAb \mid \varepsilon$

Starting Symbol = S
Non terminals = {S, A}
Terminals = {a, b, ε}

Ans 2: Given,

$S \rightarrow A1B$
$A \rightarrow 0A \mid \varepsilon$
$B \rightarrow 0B \mid 1B \mid \varepsilon$

$S \rightarrow A1B$
$A1B \rightarrow 0A1B$
$0A1B \rightarrow 00A1B$
$00A1B \rightarrow 001B$
$001B \rightarrow 0010B$
$0010B \rightarrow 00101B$
$00101B \rightarrow 00101$

$S \rightarrow A1B$
$A1B \rightarrow A10B$
$A10B \rightarrow A101B$
$A101B \rightarrow A101$
$A101 \rightarrow 0A101$
$0A101 \rightarrow 00A101$
$00A101 \rightarrow 00101$

3. Given,

$E \rightarrow E+T \mid E-T \mid T$

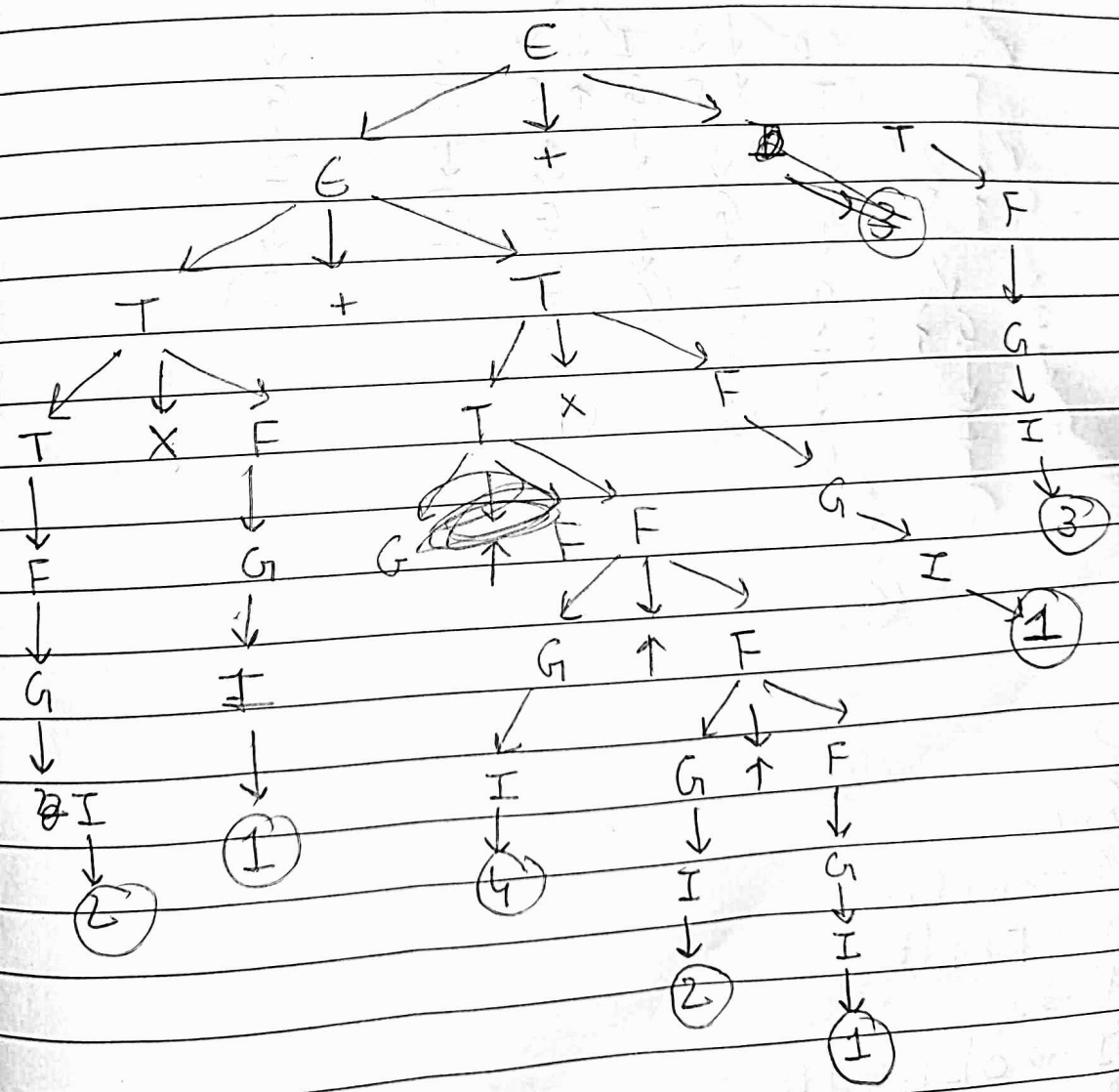
$T \rightarrow T \times F \mid T \div F \mid F$

$F \rightarrow G \uparrow F \mid G$

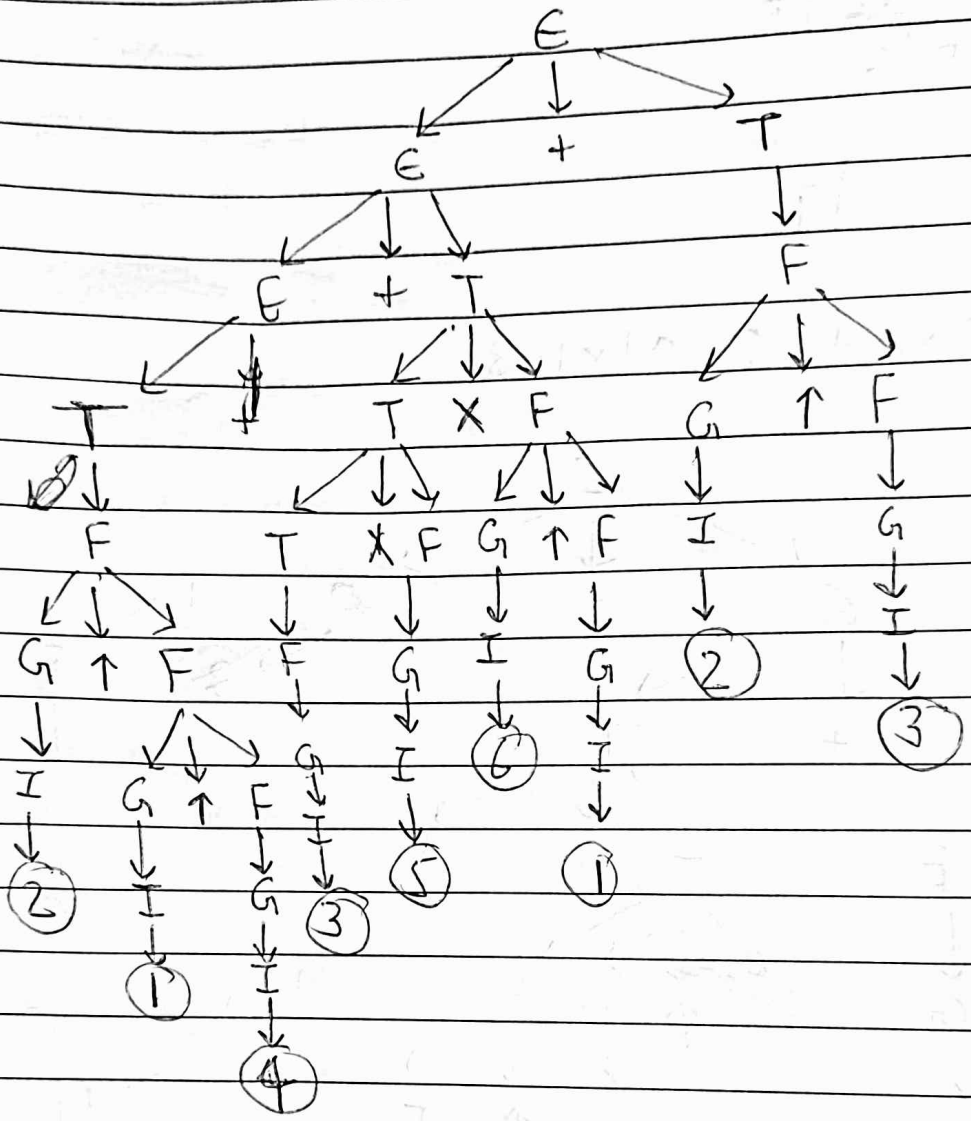
$G \rightarrow I$

$I \rightarrow 0 \mid 1 \mid \ldots \mid 9$

1) for string :- $2 \times 1 + 4 \uparrow 2 \uparrow 1 \times 1 + 3$



ii) For string: $2\uparrow1\uparrow4+3\times5\times6\uparrow1+2\uparrow3$



Ans 4: Given,

$E \rightarrow E+T \mid T$

$T \rightarrow F \times T \mid F$

$F \rightarrow I$

$I \rightarrow 0 \mid 1 \mid \ldots \mid 9$

$E \rightarrow E+T$

$E+T \rightarrow E+F$

$E+F \rightarrow E+I$

$E+I \rightarrow E+2$

$E+2 \rightarrow E+T+2$

$E+T+2 \rightarrow T+T+2$

$T+T+2 \rightarrow F+T+2$

$F+T+2 \rightarrow I+T+2$

$I+T+2 \rightarrow 2+T+2$

$2+T+2 \rightarrow 2+F\times T+2$

$2+F\times T+2 \rightarrow 2+F\times F\times T+2$

$2+F\times F\times T+2 \rightarrow 2+I\times F\times T+2$

$2+I\times F\times T+2 \Rightarrow 2+3\times F\times T+2$

$2+3\times F\times T+2 \rightarrow 2+3\times I\times T+2$

$2+3\times I\times T+2 \rightarrow 2+3\times 5\times T+2$

$2+3\times 5\times T+2 \rightarrow 2+3\times 5\times F+2$

$2+3\times 5\times F+2 \rightarrow 2+3\times 5\times I+2$

$2+3\times 5\times I+2 \rightarrow 2+3\times 5\times 6+2$

hw 5:

i) $S \rightarrow SS$

$S \rightarrow a$

$S \rightarrow b$

Possible strings for given grammer is ~~(b^*a+b^*)~~

$(a^*b^*)^* = \{a, b, \varepsilon\}$

ii) $S \rightarrow A|B$ $A \rightarrow aAb|ab$ $B \rightarrow abB|\varepsilon$

Possible strings are: ~~aa~~ ab, aabb, aaabbb, ---

&

ε, ab, abab, ababab, ---

Ans 6. Given,

$S \rightarrow AB \mid C$

$A \rightarrow aAb \mid ab$

$B \rightarrow cBd \mid cd$

$C \rightarrow aCd \mid aDd$

$D \rightarrow bDc \mid bc$

$S \rightarrow AB$

$AB \rightarrow aAbB$

$aAbB \rightarrow aabbB$

$aabbB \rightarrow aabbcBd$

$aabbcBd \rightarrow aabbccdd$