Final Examination

MD. Jobayer Rahman

ID: 011192070

CSE - 2233 (B)

Ans. to the question No. (I)

X

(a) $S \rightarrow 0S3 \mid 00S3 \mid A$

$A \rightarrow 0A2 \mid 0A22 \mid B$

$B \rightarrow 0B1 \mid 2S3 \mid \epsilon$

0 0 0 0 1 2 3 3

tree

(A)

$S \Rightarrow 00S3$

$\xRightarrow{lm}$ 0 0 0 0 S 3

$\xRightarrow{lm}$ 0 0 0 S 3 3

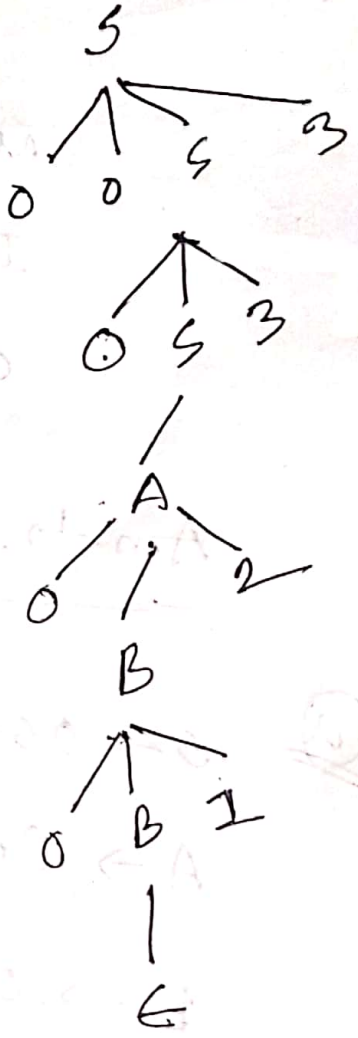
$\xRightarrow{lm}$ 0 0 0 0 A 2 3 3

$\xRightarrow{lm}$ ~~0 0 0 0 A 2 3 3~~

$\xRightarrow{lm}$ 0 0 0 0 B 2 3 3

$\xRightarrow{lm}$ 0 0 0 0 0 B 1 2 3 3

$\xRightarrow{lm}$ 0 0 0 0 0 1 2 3 3



(B)

$S \xRightarrow{lm} 0S3$

$\xRightarrow{lm}$ 0 0 0 S 3 3

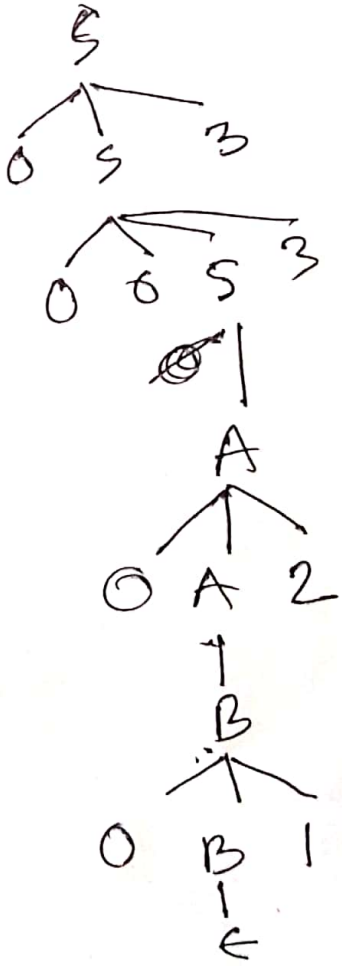
$\xRightarrow{lm}$ 0 0 0 A 3 3

$\xRightarrow{lm}$ 0 0 0 0 A 2 3 3

$\xRightarrow{lm}$ 0 0 0 0 B 2 3 3

$\xRightarrow{lm}$ 0 0 0 0 0 B 1 2 3 3

$\xRightarrow{lm}$ 0 0 0 0 0 1 2 3 3



∴ this is Ambiguous.

(b) ((a x a+a))

$E \xrightarrow{lm} T$

$\xrightarrow{lm} F$

$\xrightarrow{lm} (E)$

$\xrightarrow{lm} (T)$

$\xrightarrow{lm} (F)$

$\xrightarrow{lm} ((E))$

$\xrightarrow{lm} ((E+T))$

$\xrightarrow{lm} ((T+T)$

$\xrightarrow{lm} ((T \times F + T))$

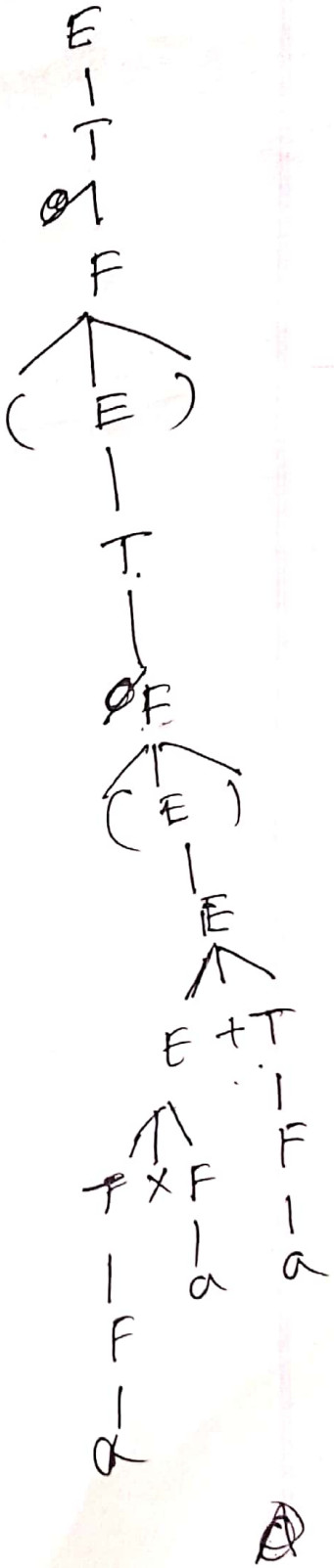
$\xrightarrow{lm} ((F \times F + T))$

$\xrightarrow{lm} ((a \times F + T))$

$\xrightarrow{lm} ((a \times a + T))$

$\xrightarrow{lm} ((a \times a + F))$

$\xrightarrow{lm} ((a \times a + a))$



This grammar is not ambiguous.

Am. to the question NO. (2)

a

$S \rightarrow aSb \mid bSa \mid aSa \mid bSb \mid A$

$A \rightarrow 0P1 \mid 1P0 \mid 0P0 \mid 1P1 \mid \in$

b

$S \rightarrow xxSyyy \mid xx\#yyy$

Ans. to the question NO. (3)

X

(a) Step-1

$S_0 \to S$

$S \to 0S3 \mid 00S3 \mid A$

$A \to 0A2 \mid 0A22 \mid B$

$B \to 0B1 \mid 2S3 \mid \in$

Step-2

$S_0 \to S \mid \in$

$S \to 0S3 \mid 00S3 \mid A \mid 03 \mid 003$

$A \to 0A2 \mid 0A22 \mid B \mid 021 \mid 022$

$B \to 0B1 \mid 2S3 \mid 01 \mid 23$

Step-3

$S_0 \to 0S3 \mid 00S3 \mid 03 \mid 003 \mid 0A2 \mid 0A22 \mid 021 \mid 0221 \mid 0B12S3 \mid 0123 \mid \in$

$S \to 0S3 \mid 00S3 \mid 03 \mid 003 \mid 0A21 \mid 0A221 \mid 021 \mid 022 \mid 0B1 \mid 2S3 \mid 0123$

$A \to 0A2 \mid 0A22 \mid 021 \mid 0221 \mid 0B1 \mid 2S3 \mid 0123$

$B \to 0B1 \mid 2S3 \mid 01 \mid 23$

Step-4

$S_0 \rightarrow A_8A_1 \mid A_8A_2 \mid A_8A_3 \mid A_8A_4 \mid A_8A_5 \mid A_8A_6 \mid A_8A_7 \mid A_9A_1 \mid A_8A_{10} \mid A_8A_9 \mid A_8A_{11} \mid A_9A_{10} \mid \in$

$S \rightarrow A_8A_1 \mid A_8A_2 \mid A_8A_3 \mid A_8A_4 \mid A_8A_5 \mid A_8A_6 \mid A_8A_7 \mid A_9A_1 \mid A_8A_{10} \mid A_8A_9 \mid A_8A_{11} \mid A_9A_{10}$

$A \rightarrow A_8A_4 \mid A_8A_5 \mid A_8A_6 \mid A_8A_7 \mid A_9A_4 \mid A_8A_9 \mid A_8A_{11} \mid A_9A_{10}$

$B \rightarrow A_8A_7 \mid A_9A_1 \mid A_8A_{11} \mid A_9$

$A_1 \rightarrow SA_{10}$

$A_2 \rightarrow A_8A_1$

$A_3 \rightarrow A_8A_{10}$

$A_4 \rightarrow AA_9$

$A_5 \rightarrow AA_6$

$A_6 \rightarrow A_9A_9$

$A_7 \rightarrow BA_{11}$

$A_8 \rightarrow 0$

$A_9 - 2$

$A_{10} - 3$

$A_{11} \rightarrow 1$

(b) Step-1

$S_0 \to S$

$S \to ACO1 \mid 0S \mid 1S \mid A1$

$A \to B \mid CA \mid \in$

$C \to 0 \mid 1$

$B \to 11B \mid 00B \mid \in$

Step-2

$S_0 \to S$

$S \to ACO1 \mid 0S \mid 1S \mid A1 \mid CO1 \mid 1$

$A \to B \mid CA \mid C$

$C \to 0 \mid 1$

$B \to 11B \mid 00B \mid 11 \mid 00$

Step-3

$S_0 \to ACO1 \mid 0S \mid 1S \mid A1 \mid CO1 \mid 1$

$S \to ACO1 \mid 0S \mid 1S \mid A1 \mid CO1 \mid 1$

$A \to CA \mid 11B \mid 00B \mid 11 \mid 001 \mid 110$

$C \to 0 \mid 1$

$B \to 11B \mid 00B \mid 11 \mid 00$

Step-4

$S_0 \rightarrow 1 \mid A A_1 \mid C A_2 \mid A_5 S \mid A_6 S \mid A A_6$

$S \rightarrow 1 \mid A A_1 \mid C A_2 \mid A_5 S \mid A_6 S \mid A A_6$

$A \rightarrow CA \mid 0 \mid 1 \mid A_6 A_3 \mid A_5 A_3 \mid A_6 A_6 \mid A_5 A_5$

$C \rightarrow 0 \mid 1 \mid$

$B \rightarrow A_6 A_3 \mid A_5 A_4 \mid A_6 A_6 \mid A_5 A_5$

$A_1 \rightarrow CA_2$

$A_2 \rightarrow A_5 A_6$

$A_3 \rightarrow A_6 B$

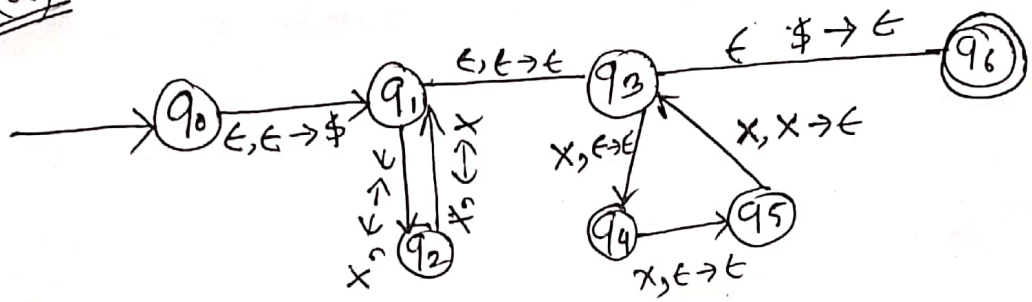
$A_4 \rightarrow A_5 B$

$A_5 \rightarrow 0$

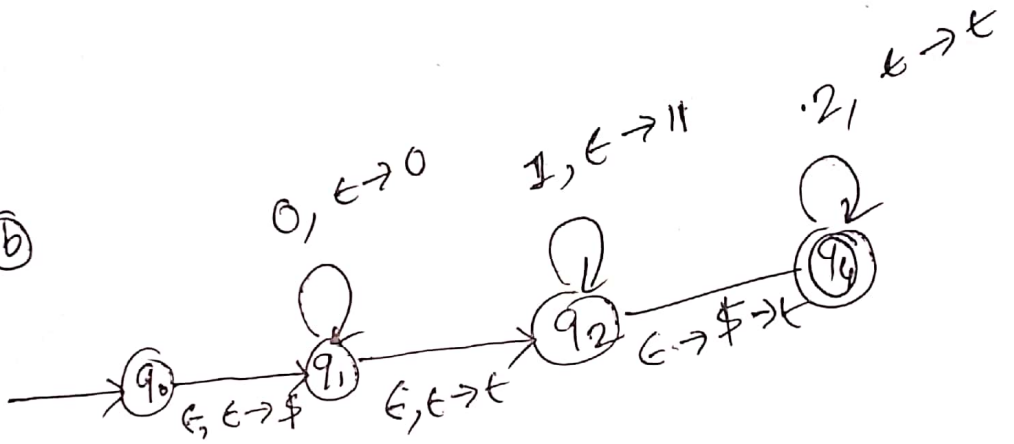
$A_6 \rightarrow 1$

Ans. to the question NO. (4)

(a)



(b)



Ans