FLA Unit - 2

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Ans1· $S \to A \mid B \mid \varepsilon$

$A \to Sa \mid a$

$B \to SbS \mid bb \mid a$

i) null production elimination

$\quad S \to ASB \mid AB$

$\quad A \to Sa \mid a$

$\quad B \to SbS \mid bS \mid Sb \mid b \mid bb \mid a$

ii) unit production elimination

$\quad \to$ no unit production

iii) All are usefull symbols,

Here, simplified,

$\quad S \to ASB \mid AB$

$\quad A \to Sa \mid a$

$\quad B \to SbS \mid bS \mid Sb \mid b \mid bb \mid a$

Ans 2·

$S \to ABC$

$A \to aAB \mid \varepsilon$

$B \to b$

$C \to ac \mid a \mid \varepsilon$

(i) null production elimination

$\quad S \to ABC \mid BC \mid AB$

$\quad A \to AAb \mid ab$

$\quad B \to b$

$\quad C \to ac \mid a$

(ii) unit production elimination

$\quad S \to ABC \mid BC \mid AB \mid b$

$\quad A \to aAb \mid ab$

$\quad B \to b$

$\quad C \to ac \mid a$

(iii) Useless production elimination

All production are usefull symbols.

$\quad S \to ABC \mid BC \mid AB \mid b$

$\quad A \to aAb \mid ab$

$\quad B \to b$

$\quad C \to ac \mid a$

Q3

Ans3. A → 0 | x y

    x → x y | ε

    y → y x 0 | x | ε

(i) Null Production Elimination

    A → 0 | xy | 0 | y | 0 | x | 01

    B → | xy | y | 1

    y → yx0 | x | x010

(ii) Unit Production

    A → 0 | xy | 0 | y | 0 | x | 01

    x → xy | y | 1

    y → xx0 | xy | y | 1 | x010

(iii) Useless Production Elimination

    A → 0 | xy | 01y | 01x | 01

    B → | xy | y | 1

    y → yx0 | xy | y | 1 | x010