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FLAT

Term Work 3 (b)

Q1 $S \rightarrow abSb$ $S \rightarrow aAb$

$S \rightarrow abab$ $S \rightarrow abSb$

$S \rightarrow abab$

Hence the expression

$S \rightarrow a \mid abSb \mid aAb$

$A \rightarrow bS \mid aAAb$

is ambiguous.

Q2. $S \rightarrow AB \mid 0$

$A \rightarrow BX \mid 1$

$B \rightarrow CD \mid 2$

$C \rightarrow AD \mid 0$

$D \rightarrow 1$

S-1 : Remove X since its unwanted.

$S \rightarrow AB \rightarrow 0$

~~$A \rightarrow BX \mid 1$~~ $A \rightarrow 1$

$B \rightarrow CD \mid 2$

$C \rightarrow AD \mid 0$

$D \rightarrow 1$

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S-II : Substitute A wherever possible

S → 1B|0

B → CD|2

C → 1D|0

D → 1

S III: Substitute C wherever possible.

S → 1B|0

B → 1DD|0D|2

C → 1D|0

D → 1

The above grammer is in CNF form.

Q3. 1. CFG for $\{a^{2n}bc \mid n \geq 1\}$

S → Abc

A → aaA | aa

2. CFG for $\{a^n b^m c^m d^n \mid m, n \geq 1\}$

S → aSd | A

A → bAc | bc

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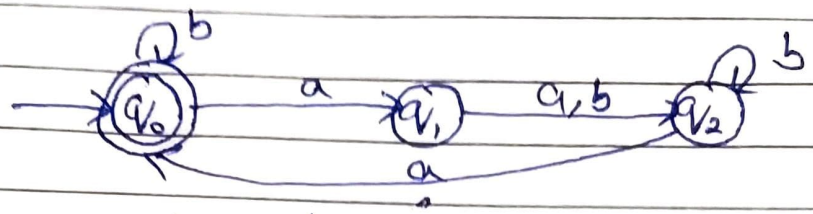
Q4.



Grammer for above DFA is

$q_0 \rightarrow a q_1 \mid b q_0 \mid \epsilon$

$q_1 \rightarrow a q_2 \mid b q_0$

$q_2 \rightarrow b q_2 \mid a q_0$