1. **Convert the given PDA to CFG.**

P = ({q}, {i,e}, {x,z},δ,q,z,F) where δ is given by δ(q,i,z) = (q,xz)

δ(q,e,x) = (q,ε)

δ(q,ε,z) = (q,ε)

## 2. Convert the PDA to CFG.

P = ({p,q}, {0,1}, {x,z},δ,q,z,F) where δ is given by δ(q,1,z) = (q,xz)

δ(q,1,x) = (q,xx)

δ(q,ε,x) = (q,ε)

δ(q,0,x) = (p,x)

δ(p,1,x) = (p,ε)

δ(p,0,z) = (q,z)

## 3. Convert the given CFG to PDA

I→a|b

S→aA

A→aABC|bB|a

B→b, C→c

## 4. Convert the given CFG to PDA

S→aBB, B→bS|c

## 5. Convert the given CFG to PDA

S→aAA, A→aS|bS|a