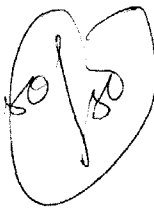


3.1.9



Samir Faei
CS 301

a.) $S \rightarrow aSb$
 $S \rightarrow aS$
 $S \rightarrow \epsilon$ ✓

b.) $S \rightarrow aSd | A | B |$
 $A \rightarrow aAc | C$
 $B \rightarrow bBd | C$
 $C \rightarrow bBc | e$

c.) $S \rightarrow BSA | e$ ✓
 $A \rightarrow a$
 $B \rightarrow bb$

d.) $S \rightarrow Ab$
 $A \rightarrow aAa | aAb | bAa | bAb | a$ ✓

e.) $S \rightarrow AcS | aTa | bTb$
 $T \rightarrow aTa | bTb | cU$
 $U \rightarrow AcU | c$
 $A \rightarrow aA | bA | a | b$ ✓

f.) $S \rightarrow e$
 $S \rightarrow AASb$
 $A \rightarrow a | e$ ✓