

بسمه تعالی



تمرین 6  
نظریه زبان‌ها و ماشین‌ها

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سوال 1:

(a)

$$S \rightarrow aSa \mid bSb$$

(b)

$$\begin{aligned} S &\rightarrow A \mid B \mid C \\ A &\rightarrow aAd \mid B \mid C \\ B &\rightarrow bBd \mid C \\ C &\rightarrow cCdd \mid cdd \mid \varepsilon \end{aligned}$$

(c)

$$\begin{aligned} S &\rightarrow A \mid B \\ A &\rightarrow SbSaSbS \mid SaSbSbS \mid SbSbSaS \mid SaSbS \mid SbSaS \\ B &\rightarrow b \mid \varepsilon \end{aligned}$$

(d)

$$\begin{aligned} S &\rightarrow aSb \mid aS1b \\ S1 &\rightarrow aS1a \mid bS1b \mid bb \mid aa \end{aligned}$$

(e)

$$\begin{aligned} S &\rightarrow BaB \mid B \\ B &\rightarrow b \mid \varepsilon \mid BB \mid bB \end{aligned}$$

(f)

$$S \rightarrow$$

(g)

$$S \rightarrow$$

## سوال 2:

(a)

ما نمی توانیم تهی را از نامتناهی شروع برداریم.

$S \rightarrow Ab \mid aB \mid C \mid AASBD \mid \varepsilon \mid a \mid aCb \mid CC \mid bCa \mid ab \mid ba \mid AABD \mid AAD$

$A \rightarrow Aa \mid a$

$B \rightarrow D \mid BBb \mid b \mid Bb$

$C \rightarrow aCb \mid CC \mid bCa \mid ab \mid \varepsilon \mid ba$  (can't remove epsilon because of CC)

$D \rightarrow Dd \mid adD$

(b)

$S \rightarrow SSA \mid aS \mid bS \mid bbD \mid \varepsilon \mid SA \mid aAa \mid bBb \mid cDb \mid bb \mid a \mid b$

$A \rightarrow aAa \mid bBb \mid cDb \mid bb$

$B \rightarrow bbD$

$D \rightarrow abD \mid ab$

سوال 3:

