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Subject: compiler Construction

(1)

Assignment # 1

Q1

(A)

LL(1) Parsing

	a	b	c	$
S	S → XY	S → XY	S → XY	S → W
X	X → a ~~X b~~	X → ϵ	X → ϵ	X → ϵ
Y			Y → ϵY	Y → ϵ
W	W → aWc	W → aWc	W → Z	W → Z
Z		Z → bZ	Z → ϵ	Z → ϵ

(b)

a	a	b	b	c	$

(i) Push S

S
$

(ii) Check Stack top element (S, a)

(iii) (S, a) = S → XY
Pop S, Push XY in reverse order

X
Y
$

(4) $(x, a) = x \rightarrow axb$
Pop x, Push axb in reverse order

a
x
b
x
$

5 (a, b) match Pop a

x
b
x
$

(6) $(x, a) = x \rightarrow axb$
Pop x, Push axb

a
x
b
b
x
$

(7) (a, a) Pop a match

x
b
b
x
$

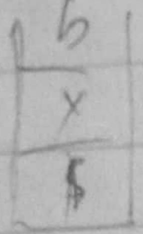
(8) $(x, b) = x \rightarrow \epsilon$
Pop x, Push ϵ

ϵ
b
b
$

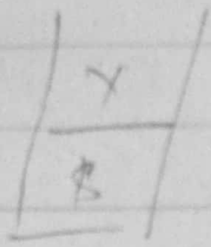
(9) Pop ϵ

b
b
x
$

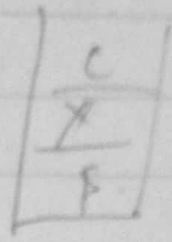
⑩ (b, b)
match
Pop b



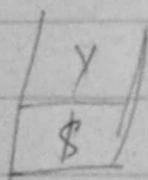
⑪ (b, b)
match
Pop b



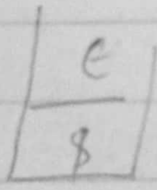
⑫ (y, c) => y → cy
Pop y, Push cy



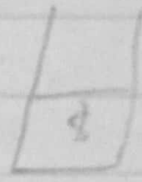
⑬ (c, c)
match
Pop c



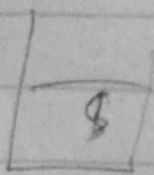
⑭ (y; $) = y → ε
Pop y, Push ε



⑮ Pop ε



⑯ $, $



Input String
Parsed match(→ Pass

Q2) A

$S \rightarrow iEts \mid iEtses \mid a$

$E \rightarrow b$

Solution

$S \rightarrow iEtSS' \mid a$

$S' \rightarrow \epsilon \mid es$

$E \rightarrow b$

B

$E \rightarrow E+T \mid T$

$T \rightarrow T*F \mid F$

$F \rightarrow (E) \mid id$

$E \rightarrow E+T \mid T$

$E \rightarrow TE'$

$E' \rightarrow +TE' \mid \epsilon$

$E \rightarrow TE'$

$E' \rightarrow +TE' \mid \epsilon$

$T \rightarrow FT'$

$T' \rightarrow *FT' \mid \epsilon$

$F \rightarrow (E) \mid id$

Q3

(A)

	State	Input Symbol	Next state
1	Q_0	'	Q_1
	Q_1	Any char	Q_2
	Q_2	'	Accept
2)	X_0	"	X_1
	X_1	Any char	X_2
	X_2	"	Accept
3)	Z_0	"""	Z_1
	Z_1	Any char	Z_2
	Z_2	"""	Accept

(B)

1) ' [^] * '
2) " [^ "] * "
3) """ [\S \S] * """

Any char: [? . ^ , * .

1) $q_0 \xrightarrow{'} q_1 \xrightarrow{?} q_2$