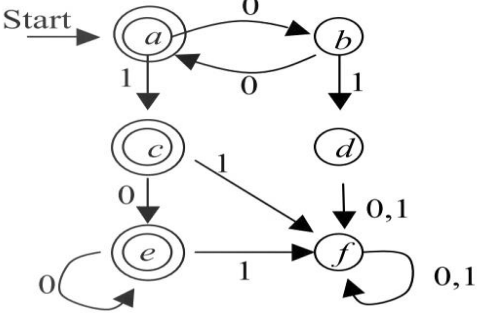
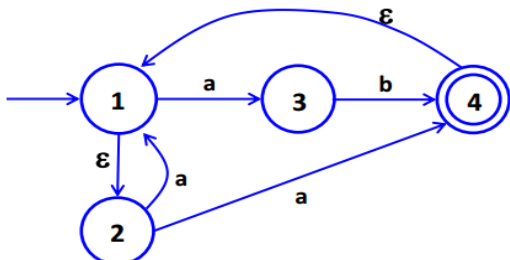




Cairo University

Cairo University – Faculty of Graduate Studies for Statistical Research**Department: COMPUTER SCIENCE****Academic Year: 2019-2020 Semester: 2****Date: 08-09-2020 Level: Diploma**

Course Title: Compiler Construction	Course code: CS510	Time: 1.5Hours	Exam Points: 100	# Exam. Sheets: 3	Model A
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1.	Shift reduce parsers are _____.	A. Bottom up parser B. Top down parser C. Both A, B D. None of the above
2.	The lexical analyzer takes ____ as input and produces a list of ____ as output.	A. Machine code, mnemonic B. Tokens, source code C. Source code, tokens D. Both a and b
3.	_____Checks that every variable must be declared before it is used.	A. Scanner B. Parser C. Semantic Analyzer D. Code generator.
4.	The length of the shortest string in the language (over $\Sigma = \{a, b\}$) of the following regular expression is _____. $a^*b^*(ba)a^*$	A. 0 B. 2 C. 3 D. 4
5.	Minimize The following DFA 	The minimized DFA has the following states: A. $\{a,c,e\}\{b,d,f\}$ B. $\{a\}\{c,e\}\{b\}\{d,f\}$ C. $\{a,c\}\{b,d\}\{e\}\{f\}$ D. $\{a,c,e\}\{b,d\}\{f\}$
6.	Convert the following NFA to DFA using Subset Construction Algorithm. 	The DFA will have the following states: A. $\{1,2\}\{3,4\},\{1,2,4\}$ B. $\{1,2\},\{1,2,3,4\},\{1,2,4\}$ C. $\{1,2\},\{1,2,3\},\{1,2,4\}$ D. $\{1,2\},\{1,2,3,4\},\{4\}$
7.	A DFA must have exactly one final (accepting) state.	A. True B. False
8.	$(000)^*$ is a regular expression that matches only strings containing an odd number of zeroes, including the empty string.	A. True B. False

9.	For the following grammar: $S \rightarrow A@$ $A \rightarrow (AB) \epsilon$ $B \rightarrow (A) x$ Find First set of (S).	A. $\{(\}$ B. $\{@,x\}$ C. $\{(\, \epsilon\}$ D. $\{@,(\}$
10.	For the grammar in Question 9. Find First set of (B).	A. $\{(\,x\}$ B. $\{@,x\}$ C. $\{x,(\, \epsilon\}$ D. $\{(\}$
11.	For the grammar in Question 9. Find Follow set of (A).	A. $\{x, (, @\}$ B. $\{x, (, @,)\}$ C. $\{x, (, @,), \$\}$ D. $\{x, (, @, \epsilon\}$
12.	Grammar in Question 9 is LL(1)	A. Yes B. No. Multiple entry in parsing table (A,'(') C. No. Multiple entry in parsing table (B,'(') D. No. Multiple entry in parsing table (S,'(')
13.	The following string accepted by grammar in Question 9. " ((x)x) "	A. True B. False
14.	The output of the following flex scanner : <pre>a*b*c*{printf("<%s ,%s>", "2", yytext);} a* {printf("<%s ,%s>", "1", yytext);} c*a*b*{printf("<%s ,%s>", "3", yytext);}</pre> Input string : bbccaa	A. $\langle 2,bbc \rangle \langle 3,ccaa \rangle$ B. $\langle 2,bb \rangle \langle 2,cc \rangle \langle 3,aa \rangle$ C. $\langle 2,bbc \rangle \langle 3,caa \rangle$ D. $\langle 2,bbcc \rangle \langle 2,aa \rangle$
15.	In the Flex Scanner in Question 14. Rule_____ will never be executed for any input string.	A. Rule One B. Rule two C. Rule Three D. None of the above
16.	For the following Grammar $S' \rightarrow S$ $S \rightarrow AA$ $A \rightarrow aA b$ The start for DFA Automata for LR(0)	A. $S' \rightarrow .S$ $S \rightarrow .AA$ $A \rightarrow .aA$ $A \rightarrow .b$ B. $S \rightarrow .AA$ $A \rightarrow .aA$ $A \rightarrow .b$ C. $S \rightarrow A.A$ $A \rightarrow .aA$ D. $S' \rightarrow S$ $S \rightarrow .AA$ $A \rightarrow .aA$
17.	The Following Grammar is LR(0). $S' \rightarrow S$ $S \rightarrow (S)S \epsilon$	A. True B. False, there is a shift reduce conflict C. False, there is a reduce reduce conflict D. Both B,C
18.	The following grammar is ambiguous $E \rightarrow E - E E + E num$ Remove Ambiguity	A. $E \rightarrow E+T T$ $T \rightarrow E-T M$ $M \rightarrow num$ B. $E \rightarrow E-T T$ $T \rightarrow E+T M$ $M \rightarrow num$ C. $E \rightarrow E+T E-T T$ $T \rightarrow num$ D. $E \rightarrow$ None of the above

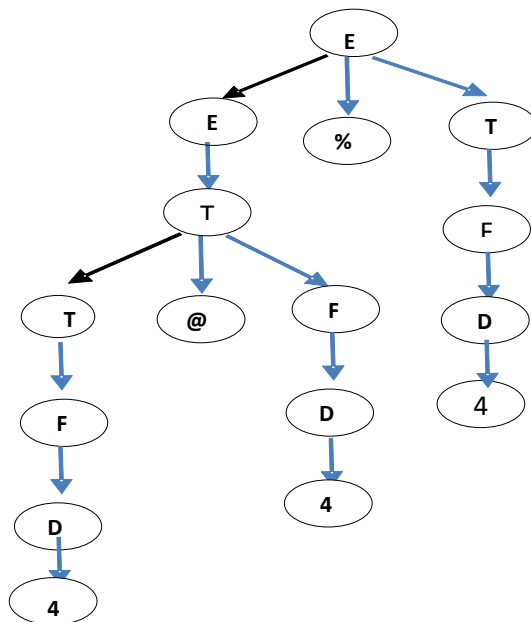
19. For the following Attribute Grammar and the semantic tree

Production	Semantic Rule
$E \rightarrow E_1 \% T$	$E.val = E_1.val + T.val$
$E \rightarrow T$	$E.val = T.val$
$T \rightarrow T_1 @ F$	$T.val = T_1.val * F.val$
$T \rightarrow F$	$T.val = F.val$
$F \rightarrow D$	$F.val = d.val$
$D \rightarrow 4$	$D.val = 4$

The value of the val attribute at E the root node Of semantic tree

- A. 20
- B. 12
- C. 64
- D. 4

20.



The val attribute is

- A. Inherited
- B. Synthesized
- C. Both A,B
- D. None of the Above