2 Consider the language that the following grammar defi nes:

<S> = $|<W>|$<S>

<W> = abb|a <W>bb

Write all strings that are in this language and that contain seven or fewer characters.

	simple <S>	variations of W	$<W> combos
	$	abb	$abb
	$$	aabbbb	$$abb
	$$$		$$$abb
	$$$$		$$$$abb
	$$$$$		$aabbbb
	$$$$$$		
	$$$$$$$		

3 <word> = <Upper><LowerCase>

<Upper> = A|B|...|Z

<LowerCase> = <Lower>|<Lower><LowerCase>

<Lower> = a|b|...|z

4 Consider a language of character strings that contain only dots and dashes. All strings in this language contain at
least four characters and begin with either two dots or two dashes. If the first two characters are dots, the last one
must be a dash; if the fi rst two characters are dashes, the last one must be a dot. Write a recursive grammar for
this language.

<word> = <dot><dot><dot><dash>|<dot><dot><dash><dash>| <dash><dash><dot><dot>| <dash><dash><dash><dot>| <dot><dot><word><dash> | <dash><dash><word><dot>

<dot> = .

<dash> = -

5	a	<word> = X| <word>Z|<word>Y	How to specify only one Y?
	b	X	
		XZ	
		XY	

6	<word> = <dot>	<dash> <word>	<word><dot>		
	a	<dot>	<dash><dot>
		<dot><dot>	<dash><dash><dot| <dash><dot><dot>
		<dot><dot><dot>	
	b	Is the string • • • • – – in this language? Explain.	

		Per second rule "<dash><word>" dashes are always left of the word. This is not possible				
	c	Write a seven-character string that contains more dashes than dots and is in the language. Show how				
		you know that your answer is correct.				
		1st word	<dot>			
		2nd word	<dot><1st word>	<dot><dot>		
		6th word	<dot><5nd word>	<dot><dot><dot><dot><dot><dot>		
		7ths word	<6th word><dash>	<dot><dot><dot><dot><dot><dot><dash>		
		the iterations shows the final answer is correct				
9	a	< legal_word > = empty string | A < legal_word > BB				
10		Is +* a – b / c ++ de – fg a prefi x expression? Explain in terms of the grammar for prefix expressions				
		the prefix has the format that has operator follwed by 2 prefix and this format matches prefix. This string begins with operator so it is a prefix. The prefix is invalid				
		<prefix>. = <identifier> | <operator> <prefix> <prefix>				
		+E1E2	E1=*E3E4			
			E3=a			
			E4=-E5E6			
			E5=b			
			E6=/E7E8			
			E7=c			
			E8=+E9E10			
			E9=+E11E12			
			E11=d			
			E12=e			
			E10=-E13E14			
			E13=f			
			E14=g			
		E2 is missing and this expression is invalid				
11		Is ab /c * efg * h /+d –+ a postfi x expression? Explain in terms of the grammar for postfi x expressions.				
		<postfix> = <identifier>|<postfix><postfix><operator>				
		this is a postfix expression because it follows the a b / -> <postfix><postfix><operator>. The expression is invalid				
		E1E2/				
		E1=a				

	E2=b			
	E3E4*			
	E3=E1E2/			
	E4=c			
	E5E6			
	E5=E3E4*			
	E6=e			
	but operator is missing after E6 and hence it's an invalid expression			
12	Consider the language that the following grammar defi nes:			
	<S> = <L>| <D><S><S>			
	<L> = A|B			
	<D> = 1 |2			
	a. Write all three-character strings that are in this language.			
	first	second		
	A	1AA		
	B	2AA		
		1BB		
		2BB		
	b. Write one string in this language that contains more than three characters			
		third		
		11AA1AA		
		12AA2AA		
		11BB1BB		
		21BB1BB		
13	Consider a language of the following character strings: The letter A , the letter B , the letter C followed by a string			
	that is in the language, and the letter D followed by a string in the language. For example, these strings are in this			
	language: A, CA, CCA, DCA, B, CB, CCB, DB, and DCCB.			
	a. Write a grammar for this language.			
		<word> = A|B|C|D | A<word> | B<word> | C<word> | D<word>		
	b. Is CAB in this language? Explain.			
		first	B	
		2nd	AB	A<firt>
		third	CAB	C<2nd>
		Yest, its possible		