CS320 Concepts of programming languages
Part II, Quiz 1
11/14/2023

Name:
BU Id:
Section A1 – B1

Question 1 (1 point)
A BNF rule has a left-hand side which is a single terminal symbol and a right-hand side which is a combination of one or more terminal or nonterminal symbols.

(a) True
(b) False

Question 2 (1 point)
A grammar is ambiguous if and only if it generates a sentence that has two or more distinct derivations.

(a) True
(b) False

Question 3 (2 points)
What regular expression corresponds to the following regular grammar (where <S> is the starting symbol)?

<S> ::= a<A>
<A> ::= c<A>
<A> ::= c<T>
<T> ::= Ɛ

1. a*c*
2. ac*
3. ac*c
4. a*c

Question 4 (2 points)
What regular expression corresponds to the following regular grammar (where <S> is the starting symbol)?
<S> ::= b<B>
<B> ::= b<B>
<B> ::= b<T>
<T> ::= Ɛ

1. b*
2. b*b*b
3. bb*b*
4. bbb*

Question 5 (3 points)
Consider the following grammar:

```
<expr>    ::=   <term> + <expr>|<expr> * <expr>|<term>
<term>    ::=   - <val> | <val>
<val>     ::=   0 | 1 | 2
```

Write a leftmost derivation for the following sentence:
`1 * 2 + 0`

Question 6 (3 points)
Consider the following grammar:

<exp>	::=	<exp> + <exp> | <ter> - <exp> | <ter> | <val>
<ter>	::=	<ter> / <val> | <con> * <ter> | <con>
<val>	::=	0 | 1
<con>	::=	c | d

Can the following sentence be generated by the grammar above? If it can, draw its parse tree.

(1) c * d / 1 – 1