CS251: Introduction to Language Processing

Tierce-1 Exam (Question-1)

Duration: 7 minutes

Notes

- Follow the instructions specified in the instruction sheet.

Question-1

[5 Points]

Consider the following ambiguous grammar:

$$\begin{array}{lcl} S & : & aXb \\ X & : & Ya|bZ|XX \\ Y & : & bc \\ Z & : & ca \end{array}$$

1. Show an example to prove the ambiguity
2. Re-write/Simply the above grammar to make it un-ambiguous.

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Tierce-1 Exam (Question-2)

Duration: 25 minutes

Notes

- Follow the instructions specified in the instruction sheet.

Question-2

[20 Points]

Consider the following grammar:

$$
\begin{array}{lcl}
Stmt & : & SVO \\
S & : & nD \\
 & | & AS \\
V & : & v \\
 & | & AV \\
A & : & a \\
O & : & \epsilon \\
 & | & S \\
D & : & 0 \\
 & | & 1
\end{array}
$$

1. Write down the FIRST and FOLLOW sets for all the non-terminals in above grammar.
2. Construct the LL(1) parser table.
3. Is the above grammar LL(1)? Justify your answer.

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Tierce-1 Exam (Question-3)

Duration: 45 minutes

Notes

- Follow the instructions specified in the instruction sheet.

Question-3

[30 Points]

Consider the following grammar:

$$\begin{array}{lcl} S & : & E \\ E & : & T - E \\ & | & T \\ T & : & - - T \\ & | & int \end{array}$$

Part-(a)

1. Construct the DFA for LR(0)
2. Construct parser table for LR(0)
3. Is the above grammar LR(0)? Justify your answer.

Part-(b): Repeat Part-(a) for LR(1) i.e.,

1. Construct the DFA for LR(1)
2. Construct parser table for LR(1)
3. Is the above grammar LR(1)? Justify your answer.