CS5404 Assignment (20 Marks)

Instructions:

1. Solve each question on new page with neat and clean handwriting.

2. Mention your Roll number and name at the top of the each page.

3. This is one hour thirty minutes assignment i.e., from 1:30 PM to 3:00 PM. You have to upload the assignment's solution before 3:15 PM (15 minutes extra for scanning and uploading). Students with late submission (will be allowed till 3:30 PM) have to pay 2 marks penalty. After 3:30 PM assignment will not be accepted through any channel.

Q. 1: Prove that the given grammar is not SLR(1) through complete step by step procedure. Further also check whether the grammar is LALR(1) or not, and LR(1) or not? Justify your answers by giving proper analysis/reason.

$S \rightarrow X$

$X \rightarrow Yb \mid aa$

$Y \rightarrow a \mid bYa$

Q. 2: Check given grammar is:

(a) LL(1) or not?

(b) LR(0) or not?

(c) SLR(1) or not?

(d) CLR(1) or not?

(e) LALR(1) or not?

$S \rightarrow AaAb \mid BbBa$

$A \rightarrow \varepsilon$

$B \rightarrow \varepsilon$

Q.3: Construct the operator precedence parser for the given grammar. Also show the way of construction of operator relation table and function table. What are the advantages and limitations of operator function table?

$X \rightarrow X + Y \mid Y$

$Y \rightarrow Y * Z \mid Z$

$Z \rightarrow a|b|c|d$

Q.4: Consider following SLR (1) grammars:

(i) $S \rightarrow X$

$X \rightarrow Xx \mid \varepsilon$

(ii) $S \rightarrow X$

$X \rightarrow xX \mid \varepsilon$

For given input string x*, the SLR(1) parser for one of these grammars uses O(n) space while for other grammar it uses only O(1) space in its parsing stack. Find that for which grammar it takes O(n) and for which O(1), and also justify your answer.