AHSANULLAH UNIVERSITY OF SCIENCE AND TECNOLOGY

Program: **B. Sc. in Computer Science and Engineering**

Department: **Computer Science and Engineering**

Course No: **CSE4130** Course Title: **Formal Languages and Compilers Lab**

Examination: **Final Quiz, Fall 2019** Date: **23.09.2020** Full Marks: **20**

Instructions:

1. Start coding with the following comment: [File Name: *yourID_FinalQuiz_QuesNo*]

   /* Name: ID: Lab Group:
   Exam: Final Quiz Course No: CSE4130 Session: Fall 2019
   */
2. Write your codes on A4 size paper.
3. Scan your handwritten answer script with clear visibility and convert it into a single pdf file.
4. Name the pdf file as: ***YourID_FinalQuiz.pdf***.
5. Upload the soft copies of your codes and the pdf file of the handwritten answer script to "Final Quiz" created as assignment in google classroom.
6. Preserve your codes and handwritten answer script as it will be collected after reopening of the University.

Q1. Write a program to read a C program as input and find out how many Relational Operators are there in the program per line. You must write the output as [*Line no. XX: No. of Relational Operators*] in a file and display the output on console reading from the file. *Note that, the lexemes of the program have to be sent from the main function to a separate user-defined function where the decision will be taken whether that lexeme is a relational operator or not. But the main function will write the output file.* **[10]**

Sample Input	Sample Output

`#include<stdio.h>`
`void main(void){`
`  int a, b;`
`  if(a<=5) printf("Hi");  // <= Rel-op`
`  else if (b<5 && a==4)`
`  printf("!= is rel-op.")`
`}`
	Line No. 4: 1
	Line No. 5: 2

Q2. Design a recursive-descent parser for the following grammar and mention some strings (at least one from each production rule) from the language generated by the grammar. **[10]**

$$E \rightarrow aA \mid bAB$$
$$A \rightarrow b \mid bA$$
$$B \rightarrow a \mid \varepsilon$$