Daffodil International University

Department of Computer Science & Engineering
Semester Final Examination, Fall-2019
Sections, Teachers & Campus: All
Course Code: CSE331, Course Title: Compiler Design (*Day*)

Time: 2 hours **Total Marks: 40**

Answer all the questions. The figures in the right margin indicate the full marks. All portions of each question must be answered sequentially.

1. *a)* Produce LR (0) table and **Canonical Table** from the following grammar. **[6]**

   Z → E$
   E → T
   E → E + T
   T → i
   T → (E)

   b) Why optimization is required in compiler design? What are the techniques for code optimization? Briefly describe about two optimization techniques. **[4]**

2. *a)* Draw the following Table in your answer booklet and Find the **FIRST ()** and **FOLLOW ()** functions from the following productions. **[5]**

Productions	FIRST ()	FOLLOW ()
S → (L) | Eb | a		
L → cL' | (L) L' | EbL' | aL'		
L' → , SL' | ε		
E → [E] E' | cL' c E' | (L) L' c E' | aL'cE'		
E' → dE' | b L' c E' | ε		

   b) Construct a predictive parsing table from the grammar in Question 2(a) using LL (1) parser. **[5]**

3. *a)* Show the **syntax tree** and **directed acyclic graph** for the expression: **[5]**
   X = (a+a) + b*c + (b*c+c) + (d+d+d+d)
   Convert the above expression in **Three Address Code**.

   b) For the expression stated in question *Q3(a)* produce **Quadruples data structure** *and* **Triples data structure** **[5]**

4. *a)* Find the Leaders, draw the Basic Blocks and Flow Graph by considering the following three address code. **[6]**

1. loc = -1	5. L1: t1=2*i	9. L3: loc =i
2. i=0	6. t2=A[t1]	10. L4: t3=i+1
3. if i<100 goto L2	7. If t2=x goto L3	11. i=t3
4. goto L3	8. goto L4	12. goto L1

   b) How error recovery policy helps the Compiler? Explain any two error recovery strategies. **[4]**

Believe you can and you're halfway there. – Theodore Roosevelt