United International University (UIU)

Dept. of Computer Science & Engineering (CSE)

Final Exam Summer 2023

CSE 4611/CSI 411: Compiler Design/Compiler

Total Marks: **40** Duration: 2 hours

Answer all questions. Figures are in the right-hand margin indicates full marks.

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.

1.	Read the following code and detect different types of errors.
	
	1. include<stdio.h>
	2. include<canio.h>
	3. void foo (int a, void b; float c){
	4. if(a/c = 0)
	5. print("Done");
	6. return a;
	7. }
	8. int main(){
	9. int a1 = 0, b1 = 1, 1a;
	10. flaot c, temp = 0;
	11. a = b1 + c;
	12. temp = fao(b1, a);
	13. a1 = a1>b1 ? "a" : "2" ;
	14. if(a1=b1)
	15. foo(a, c1);
	16. else(temp == foo(a1, b1, c))
	17. printf("Not Done : %d", a);
	18. return c;
	19.}
		8

2.	Construct a Predictive Parsing table for the following grammar & also check whether string "cdbcaadbc" is accepted or not. The sequence of Moves by Predictive Parser in a table (using stack). A → Bc / Aa / c B → Bb / Ad / d	[4]

3. Eliminate immediate left recursion from the following grammar. [4+4]

(a) E → E+E | (E) | EA | *A
A → AB | AAC | Ba | Cb | ∈
B → B + B | BBAD | B(BA) | b | ∈
D → DC | D/C | d/C
C → (C) | a | b | c | E

(b) M → MooN | mN | MN | ∈
N → Night | NN | Noon | ∈
O → OP | oOP | ON | Pot | ∈
T → 1 | 2 | 3 | ∈

4. Left Factor the following. [4+4]

(a) Consider each word as a single terminal.

X → Poet Loves Poetry | Poets eat Sugar | Parrot talks | palm tree | Panache | Poker face | polite nature | polishing | Poetic | police chase | parochial | paradox | persisting

(b) Consider all the terminals are of single character/number/symbol.

A → ([2+3]) | ((a+b)) | (2+3(4*5)) | (2-3(1/5)) | (2*3) | (2+5(1*2)) | (2+3(1/2)) | ((a+4)) | ((2*6))
B → animal | anemic | anatomy | analytical | archaic | arcahe | ardor | anapol | aneche | arcagi

5. For the following grammars, write down the FIRST and FOLLOW sets for each nonterminal. Consider all the terminals are of single character/number/symbol. [4+4+4]

(a)

$X \rightarrow eXYTgh \mid iXPrq \mid YtPrq \mid Pgh \mid cd$

$Y \rightarrow pqXP \mid c \mid d \mid Piy \mid TroXg \mid \in$

$P \rightarrow Yq \mid PcTX \mid iqcfXiyYqXY \mid cY \mid \in$

$T \rightarrow e \mid u \mid YPjl \mid iYrTP \mid \in$

(b)

$P \rightarrow iPRtG \mid dbGi \mid R \mid GRc \mid xy$

$R \rightarrow abcRG \mid cPG \mid io \mid cR\backslash t \mid \in$

$G \rightarrow pGRc \mid y* \mid xR + y \mid aPR \mid \in$

(c)

$I \rightarrow L + Dc \mid IopL \mid IqDQL + \mid QLI5c \mid \in$

$L \rightarrow abIch \mid agIrx \mid aQD - Li \mid ILbQD \mid \in$

$D \rightarrow Qst \mid LIb \mid IL(a) \mid D + LQo \mid De \mid \in$

$Q \rightarrow aIQa \mid QrtLId \mid QxyDL \mid cDIo \mid \in$