BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Midterm
Duration: 80 minutes

Set - A

Semester: Summer 2024
Full Marks: 40

CSE 420: Compiler Design

Figures in the right margin indicate marks.

Answer all the questions

COs	Questions	Marks
CO3	1. Consider the following grammar and look at the SLR(1) parse table below:	10

1. $E \rightarrow E + T$
2. $E \rightarrow T$
3. $T \rightarrow T * F$
4. $T \rightarrow F$
5. $F \rightarrow (E)$
6. $F \rightarrow id$

STATE	ACTION						GOTO		
	id	+	*	(	)	$	E	T	F
0	s5			s4			1	2	3
1		s6				acc			
2		r2	s7		r2	r2			
3		r4	r4		r4	r4			
4	s5			s4			8	2	3
5		r6	r6		r6	r6			
6	s5			s4				9	3
7	s5			s4					10
8		s6			s11				
9		r1	s7		r1	r1			
10		r3	r3		r3	r3			
11		r5	r5		r5	r5			

	Show the parsing simulation using **stack** for the input string, (***id*id)+id***	
CO3	2. Consider the following *SLR Grammar*. Draw **LR(0) automaton** and construct **SLR parse table** 1. $T \rightarrow B\ C$ 2. $B \rightarrow$ ***int*** 3. $B \rightarrow$ ***float*** 4. $C \rightarrow \varepsilon$ 5. $C \rightarrow$ [**num]** C	10
CO2	3. Construct the DFA from the following RE using **Direct Method** (a | ε) (a | b | c) (b | c)*	15
CO1	4. What are different types of errors that can be detected during the compilation process? Which states of the compiler detect what errors?	5

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Answer all the questions

COs	Questions	Marks
CO3	1. Consider the following grammar and look at the SLR(1) parse table below: 7. $A \rightarrow A + B$ 8. $A \rightarrow B$ 9. $B \rightarrow B * C$ 10. $B \rightarrow C$ 11. $C \rightarrow (A)$ 12. $C \rightarrow id$	10

STATE	ACTION						GOTO		
	id	+	*	(	)	$	A	B	C
0	s5			s4			1	2	3
1		s6				acc			
2		r2	s7		r2	r2			
3		r4	r4		r4	r4			
4	s5			s4			8	2	3
5		r6	r6		r6	r6			
6	s5			s4				9	3
7	s5			s4					10
8		s6			s11				
9		r1	s7		r1	r1			
10		r3	r3		r3	r3			
11		r5	r5		r5	r5			

	Show the parsing simulation using **stack** for the input string, ***id+(id*id)***	
CO3	2. Consider the following *SLR Grammar*. Draw **LR(0) automaton** and construct **SLR parse table** 1. $V \rightarrow P\ Q$ 2. $P \rightarrow$ ***int*** 3. $P \rightarrow$ ***float*** 4. $Q \rightarrow \varepsilon$ 5. $Q \rightarrow$ [**size]** Q	10
CO2	3. Construct the DFA from the following RE using **Direct Method** (x | ε) (x | y | z) (y | z)*	15
CO1	4. Explain how lexical analyzer and the syntax analyzer interact during the compilation process	5