BRAC UNIVERSITY
Department of Computer Science and Engineering

Examination: Midterm | Semester: Fall 2024

Duration: 1 Hour 10 Minutes | **Set - A** | Full Marks: 30

CSE 420: Compiler Design

Figures in the right margin indicate marks.

Answer all the questions

COs	Questions	Marks
CO1	1. Draw the architecture diagram of a typical compiler showing the different steps. Write one/two sentences explaining what each step does.	2+3=5
CO3	2. Draw the LR(0) automaton for the following grammar. *(You will lose 0.5 point for each missing state,wrong LR(0) items in a state, and missing/incorrect transition arrows.)* A -> N O E N -> id O -> = O -> '+=' O -> '-=' E -> E + N E -> N Here the alphabet of terminal symbols is {=, '+=', '-=', +, id}	10
CO3	3. Compute the first and follows of non-terminal symbols for the following augmented grammar. A' -> A A -> BC B -> D C -> N*D C -> ε N -> id D -> num D -> ε The alphabet of terminal symbols is {*, id, num}. Don't forget to consider the end-marker $.	2+3=5

CO3	4. Consider the following grammar and look at the SLR(1) parse table below: 1. E → E + T 2. E → T 3. T → T * F 4. T → F 5. F → (E) 6. F → id	10

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 how an SLR(1) parser with following grammar rules and parsing tables process the following input string. id+id*id