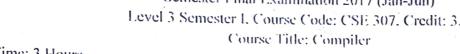
# Hajee Mohammad Danesh Science and Technology University, Dinajpur Department of Computer Science and Engineering

#### B. Sc. in CSE

### Semester Final Examination 2017 (Jan-Jun) Level 3 Semester I, Course Code: CSE 307, Credit: 3.0





. Time: 3 Hours

Total Marks: 90

[N.B. The figure in the right margin indicates the marks allocated for respective question, all the portions of each question must be answered consecutively/

### Section-A Answer any THREE

1.	a)	What is a compiler, what does it do?	2
	b)	Define meta-language? Explain the use of T-diagram to explain a compiler.	
	c)	Explain the following terms in short: Preprocessor, Assembler, Linker, and Loader.	
	d)	Write the names of different phases of a compiler.	4
2.	a)	What is Context-Free Grammar (CFG)? Describe its different components.	1+4
	b)	Consider following grammar: E→E+E E-E 1 2 3 4 5 6 7 8 9 0  Is it an ambiguous grammar? Why? If yes re-write the grammar to eliminate the ambiguity and also demonstrate the updated grammar.	1+3 +3
	c)	What is derivation of a CFG? Explain with example.	3
3.	a)	Explain the use of semantic rules in compiler construction with example.	4
	b)	Write the difference(s) between bottom-up and top-down parser.	4
•	c)	"A predictive parser is a recursive descent parser that does not require backtracking". Explain	4
		the statement with proper example.	
. e.	d)	When is a grammar said to be left recursive? Explain with example.	1+2
4.	a)	Describe the role of the input buffering process during lexical analysis.	4
	b)	Write the difference(s) between syntactic errors and semantic errors.	3
	c)	Explain the basic working principle of panic mode error recovery and mention its benefits.	
	d)	Why elimination of left recursion from a grammar is important? Explain the process with example.	1+3

## Section-B

## Answer any THREE

١.	a) Describe the role of FIRST and FOLLOW of a grammar in compiler design.				
		Write the rules of computing FIRST (A) for all grammar symbol A.		3	
	e)	Define LL and LR parser.		5	
	d)	Find LL derivations of "1*2+3" considering the following grammar.		5	
		E→TP			
		P→+E  <b>E</b>			
		T→FM			
		м→*т   т			
		$F \rightarrow N$			
2.	a)	Write the difference(s) between about			
		and energial between abstract and concrete parse tree with example.			
	b)	considering the following CFG. Assume the grapheds at the state of the	>En >E+T T	7	
		T-	>T*F F > (E)  D		
	c)	How operator precedence can be maintained in a CFG? Explain your answer given in question 2(b).	0 1 2  8 9 er using the CFG	41	
3.	a)	a) Write syntax directed definition (SDD) for the CFG given in question 2(b). Assume the symbols '+' and '*' for addition and subtraction respectively.			
	ხ)	How quadruples and triples can be used to generate tree address code? Explain the procedure 24 with proper example.			
	c)	Translate the arithmetic expression a+b-(b+c) into quadruples and triple	es.	5	
4.	a)	What is target code? When do compilers generate target code?		1+2	
	b)	What is flow graph? State its significance in code generation.		1+3	
	c)	Mention the key benefits of code optimization by a compiler.		4	
	d)	How do compilers usually perform "Dead Code Elimination"?	Describe with proper	4	