Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India

(Autonomous College Affiliated to University of Mumbai)

Mid Semester Examination

March 2019

Max. Marks: 20 **Duration: 1 Hr**

Class: TE **Semester:VI**

Course Code: CE61 **Branch: Computer Engineering**

Name of the Course: System Programming and Compiler Construction

Instructions:

(1) All questions are compulsory

(2) Assume suitable data if necessary

(3) Draw neat diagram wherever required.

Q No.		Max. Marks	CO
Q.1	Enlist the four functions used while constructing a DFA directly from a regular expression without constructing an intermediate NFA? Write rules to compute any two of the **distinct(not similar)** four functions without giving examples. (State only rules. No detailed explanation required.)	5	CO3
Q.2.	Consider the following left factored grammar where E (start symbol), T, X, Y are non terminals and (,), int, + and * are terminals:- E $\rightarrow TX$ $T \rightarrow (E)$ | int Y $X \rightarrow +E \mid \epsilon$ $Y \rightarrow *T \mid \epsilon$ Construct LL(1) parsing table and find whether the above grammar is LL(1) or not. **OR** Consider the following grammar where S is a non terminal and (,) and ID are terminals:- S $\rightarrow (S)$ S $\rightarrow ID$ Construct LR(0) parsing table for the above given grammar and find whether the above grammar is LR(0) or not.	5	CO3
Q.3	Grammar in Q.2(first OR part) is left factored grammar where X and Y are newly introduced non terminals. E $\rightarrow TX$ $T \rightarrow (E)$ | int Y $X \rightarrow +E \mid \epsilon$ $Y \rightarrow *T \mid \epsilon$ a. Convert it into original form (E and T are non-terminals where E is a start symbol)and rewrite the grammar productions. b. Construct the parse tree for the input string "$int * int + int$" (No need to design any type of parser. Use your own logic to construct a parse tree). c. Indicate the handle in the input string "$int * int + int$".	5	CO3

Q.4	Construct SLR(1) parsing table for the following grammar where S, A and B are non-terminals and a, b, c, d and e are terminals: $S \rightarrow aABe$ $A \rightarrow Abc \mid b$ $B \rightarrow d$ OR Given below is a CLR parsing table and numbered grammar productions where S is a non terminal and (,) and ID are terminals	5	CO3

	Action				GOTO
State	(	)	ID	$	S
0	S3		S1		2
1				R2	
2				Accept	
3	S6		S4		5
4		R2			
5		S7			
6	S6		S4		8
7				R1	
8		S9			
9		R1			

1. $S \rightarrow (S)$
2. $S \rightarrow ID$

Parse the input string "(((ID)))" using LR parsing algorithm. Show the contents of Stack, input and write actions accordingly.