

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

September 2018

Max. Marks: 20

Duration: 01 hr

Class: T.E.

Semester: V

Course Code: IT54/CE55

Branch: Information Technology/Computer

Engineering

Name of the Course: Theoretical Computer Science

Instruction:

(1) All questions are compulsory

(2) Draw neat diagrams

(3) Assume suitable data if necessary

Q.1 (a) Construct a Mealy machine for input from Σ^* , where $\Sigma = (0,1)$, if the input ends in '101', the output should be 'X'; if the input ends in '110', output should be 'Y'; otherwise , output should be 'Z'. Q.2 (a) Consider the following grammar $S \rightarrow AB aaB$ $A \rightarrow a Aa$ $B \rightarrow b$ (i) Show that the grammar is ambiguous (ii) Construct an unambiguous grammar that describe the same language OR Q.2 (a) Convert the following CFG to CNF $S \rightarrow ABA$ $A \rightarrow aA a$ $A \rightarrow aA A \rightarrow aA A$ $A \rightarrow aA A$ $A \rightarrow aA A \rightarrow aA A$ $A \rightarrow aA A$ $A \rightarrow aA A$ $A \rightarrow aA A$ $A \rightarrow aA A$	ON		T	
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a. L = { $a^m b^n$ where m > 2, n > 3 }	Q.3 (b)	Design CFG for the following languages	02	CO3
b. L = { $a^ib^jC^k$ where k = i+j and i,j\ge 1}		a. $I_{n} = \{a^{m}b^{n} \mid \text{where } m > 2, n > 3\}$	02	CO3
$0. \text{ b} - \{\text{a.v.c. where } K = 1+\text{j and } 1,\text{j} \geq 1\}$		b $I = \begin{cases} 3^i h^i C^k \text{ [where } h = 1, 1 \ge 0 \end{cases}$		
		$0. D = \{a \circ C \mid \text{where } k = 1+1 \text{ and } 1,1 \ge 1\}$		

= Mendian Start State

		δ	ε	a	b		4		
		1	2	3	-				
		2		2	-				
4		3	4	-	3	×			
		4		5	2				
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	a)Construct N b)Convert the	FA witho	ut ϵ -trans	sitions				06	C

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